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A
DICTIONARY OF BIRDS

BY

ALFRED NEWTON

ASSISTED BY

HANS GADOW

WITH CONTRIBUTIONS FROM

RICHARD LYDEKKER
B.A., F.R.S.

CHARLES S. ROY
M.A., F.R.S.

AND

ROBERT W. SHUFELDT, M.D.
(LATE UNITED STATES' ARMY)

PART III. (MOA–SHEATHBILL)

LONDON
ADAM AND CHARLES BLACK
1894

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LANDSCAPE

Pt. 3

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was promptly (14th Feb. 1843) substituted for it and has ever since held ground (*Proc. Zool. Soc.* 1843, pp. 1, 2, 8-10, 19). In due time these specimens with others, subsequently received from the same quarter (*tom. cit.* pp. 144-146), and referred to five, or rather six, distinct species of the genus [1] were fully described and figured (*Trans. Zool. Soc.* iii. pp. 235-275, pls. 18-30), forming the first of that incomparable series of memoirs continued over nearly forty years which will always be associated with the author's name,[2] but cannot be here further particularized, though mention must be made of the assistance rendered by Mr. Percy Earl and by Mr. Walter Mantell.

The Moas inhabited both the North and South Islands of New Zealand, where they were represented by a considerable number of species, of which the smallest was scarcely larger than a Turkey, while the largest had a tibia of more than a yard in length. We are inclined to estimate the number of species at about 20; Capt. Hutton (*N. Zeal. Journ.* i. pp. 247-249; *Trans. N. Zeal. Inst.* xxiv. pp. 93-172) admits, indeed, 26 species, but some of these we should prefer regarding merely as varieties or sexes. Certain species were peculiar to the North, and others to the South Island, while some were common to both. A femur described under the name of *D. queenslandiæ* [3] appears to belong to a Moa, and if its reputed place of origin be correct, shews that the Family extended to Australia;—a fact in distribution which, if true, is of extreme importance.

When New Zealand was first systematically explored by Europeans, Moa-bones were found lying on the surface of the ground in many districts in great profusion, being especially abundant near the old cooking-places of the natives, and often shewing traces of the action of fire. They also occur in the most superficial and recent deposits, such as blown sands, as well as in caves and swamps. Many of the latter, such as that of Glenmark, near Canterbury, when drained have been found to be full of Moa-bones, frequently in all conceivable positions. In one particular district of the South Island, where climatic conditions appear to be peculiarly favourable, skeletons have been found with the bones connected by dried muscles, ligaments, and integument with the cuticle and feathers. Fragments of egg-shells, as well as pebbles swallowed by the birds and contained in their stomachs at their death, together with impressions of footprints, have likewise been discovered. The discovery of remains of a Moa (*Anomalopteryx antiqua*) in clay on Timaru Downs seems, however, to carry back the group to the Pliocene, or possibly the upper part of the Miocene period; but the age of the beds has been called in question by Mr. H. O. Forbes. That Moas lived down to a comparatively recent epoch is abundantly evident, and it is practically certain that they formed a considerable portion of the food of the human race by whom New Zealand was first peopled, and by whom they were in great part or wholly extirpated. Capt. Hutton considers that in the North Island Moas were exterminated not less than 400 or 500 years ago, while in the South Island they might have lingered a century later. The larger species (*Dinornis*) were always comparatively rare, but many of the smaller forms were very numerous. How so many became entombed in the swamps is a question not yet solved; although it is suggested that *débâcles* during a glacial period may have been the chief agents.

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[1] Namely *D. giganteus, ingens, struthioides, dromæoides, didiformis* and *otidiformis.* The original specific name *novæ-zealandiæ* was tacitly dropped.

[2] This series was issued in 1879 in a separate form under the title of *The Extinct Birds of New Zealand.*

[3] De Vis, *Proc. R. Soc. Queensl.* i. p. 27, pls. iii. iv. (1884). Etheridge, *Rec. Geol. Surv. N. S. W.* i. p. 128 (1889).

As a rule, Moas were destitute of wings, although Capt. Hutton states that a rudimentary pair existed in *Anomalopteryx* (*Palapteryx*) *dromæoides*. The nearest allies of the Moas being apparently the KIWIS, it seems a fair inference that the females were larger than the males; and this is confirmed by bones differing only slightly, but constantly, in size.[1] The feathers differ from those of the Kiwis in having an aftershaft.

Moas are distinguished from all existing *Ratitæ* in having a bony bridge on the anterior surface of the lower end of the tibia above the condyles (fig. 1). The tarso-metatarsus (fig. 2) has three distal trochleæ, and in most cases (according to Capt. Hutton probably all) carried a hallux. The beak (unlike that of the Kiwis) is short and stout; the form of the lower jaw being either U-like or V-like. The general form of the pelvis is very like that of the Kiwis; but the sternum (fig. 3) differs by the absence of the superior notch, the more divergent lateral processes, and the abortion or disappearance of the grooves for the coracoids.

The most remarkable features which the birds present are the gigantic dimensions attained by some of them, and the great number of species occurring in such a limited area as New Zealand. The absence of Mammals in those islands has doubtless been the chief cause which has led to this great development, both as regards species and individuals, of Moas (as well as of other flightless birds); and it has generally been considered that this development has taken place entirely within the limits of these islands;[2] while Capt. Hutton suggests that the genera may have been differentiated on separate islets by subsidence during the Pliocene period. As regards their introduction into New Zealand, Mr. Wallace (*Island Life*, pp. 446, 447) is of opinion that Cassowaries, Emeus, *Dromornis*, Kiwis

[1] Capt. Hutton does not admit this sexual difference in size.

[2] If *D. queenslandiæ* be truly Australian, this view will need modification.

and Moas were derived from an Asiatic stock of Ratite birds; but Capt. Hutton objects to this view, and suggests that the Moas are descended from volant birds, allied to the TINAMOUS, which inhabited New Zealand during the Eocene. The Moas are thus regarded as the ancestral stock of all the Australasian *Ratitæ*, while those of Asia and America are supposed to have had a totally independent origin. There are, however, many objections to this view; one of the most obvious being the absence of any evidence of the presumed Tinamou-like Eocene birds.[1]

Although, as already mentioned, there is some uncertainty as to the actual number of species of Moas, yet there is no doubt that the number was large. The Family may be divided into at least 5 genera, of which the first and last are very widely separated, although connected to a certain extent by the intermediate forms.[2]

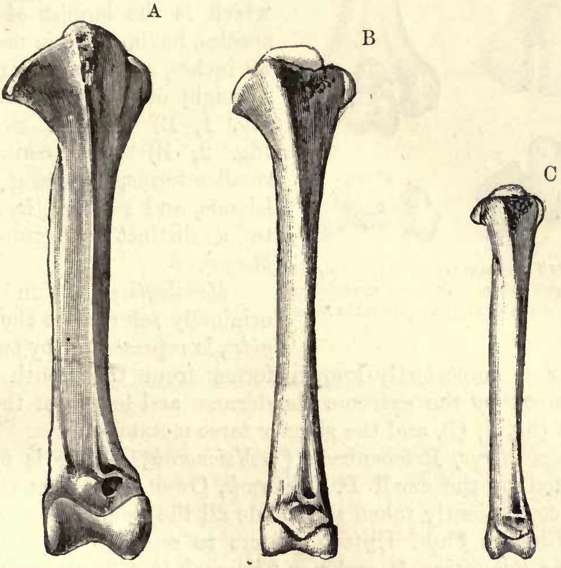

Fig. 1. RIGHT TIBIA of *Euryapteryx gravis* (A), 1/6, of *Dinornis gracilis* (B), 1/8, and *Megalapteryx tenuipes* (C), 1/8. Anterior view.
(From Lydekker's 'Catalogue of Fossil Birds in the British Museum.')

The typical genus *Dinornis*, Owen, includes the tallest of the Moas, and is characterized by the length and slenderness of the tibia (fig. 1, B) and tarso-metatarsus (fig. 2, B), and also by the broad and flattened beak, the apparent absence of the hallux, and the width and convexity of the sternum. The typical *D. novæ-zealandiæ* (including *D. giganteus* and *D. ingens*[1]) is mainly confined to the North Island, and is one of the largest species, the length of the tibia of the presumed female being 35 inches. In the South Island this Moa was represented by the closely-allied *D. maximus* (*D. robustus*, in part), which is the largest of all the species, having a tibia measuring 39 inches, and probably reaching a height of 12 feet. *D. gracilis* (fig. 1, B) and *D. struthioides* (fig. 2, B) were considerably smaller forms, occurring in both islands, and referred by Hutton to a distinct subgenus (*Tylopteryx*).

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[1] It is not easy to reconcile Capt. Hutton's views as to the impossibility of an immigration of flightless birds having taken place into New Zealand, while he admits that emigrations must have happened.

[2] Capt. Hutton adopts 7 genera (one of which he subdivides into two sub-genera), exclusive of one of those noticed below.

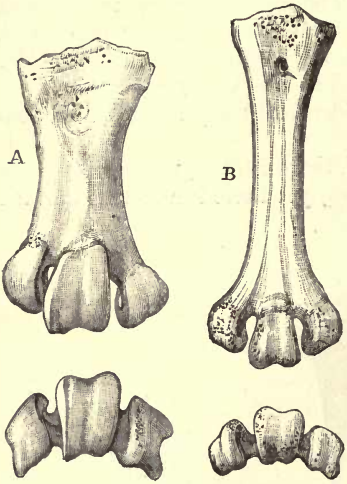

Fig. 2. Right Tarso-metatarsus of *Pachyornis elephantopus* (A), and *Dinornis struthioides* (B), 1/6. Anterior aspect. (From the same work.)

Megalapteryx, Von Haast, originally referred to the *Apterygidæ*, is represented by two much smaller and imperfectly-known forms from the South Island, characterized by the extreme slenderness and length of the femur and tibia (fig. 1, C), and the shorter tarso-metatarsus.

Anomalopteryx, Reichenbach (= *Meionornis*, Haast) is typically represented by the small *D. didiformis*, Owen, and, in our opinion, may be conveniently taken to include all the smaller species of the group, although Capt. Hutton prefers to separate Owen's *D. dromæoides* as *Palapteryx*, *D. curtus* as *Cela*, and *D. didinus* as *Mesopteryx*. On the other hand, Owen's *D. casuarinus*, which Von Haast included in *Meionornis*, is placed by Capt. Hutton with *Emeus crassus*. Whether included under one or more generic headings, all these forms are characterized by having the tibia and tarso-metatarsus considerably shorter and stouter than in *Dinornis*, while the beak is narrow and more or less pointed, the hallux present (as in the following genera), and the sternum (fig. 3, A) very long and narrow. There is great difficulty in correctly identifying the various members of this group with the species named by Owen on the evidence of detached bones. *A. casuarina*, with a tibia measuring 19 inches in length, is the largest form, and *A.* (*Cela*)

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[1] If these forms be regarded as distinct, the name *novæ-zealandiæ* should be adopted for the latter.

oweni, in which the tibia measures only 9·2, the smallest. *A. parva* is the only member of the Family of which there is a perfect skeleton in English collections. It is identified by Capt. Hutton with the typical *A. didiformis*; but a skeleton transmitted by Von Haast to the British Museum and assigned to the latter has a relatively smaller skull.[1] In the type of *A.* (*Mesopteryx*) *didina* the integuments of the head and feet are still preserved.

Emeus, Reichenbach, was established on *D. crassus*, Owen. It is a rather large species, to which Owen and Von Haast assigned a broad-billed skull, and although Capt. Hutton states that the skull is really of the narrow-beaked type of *Anomalopteryx*, we have reason to believe that the original view is correct. This Moa was confined to the South Island.

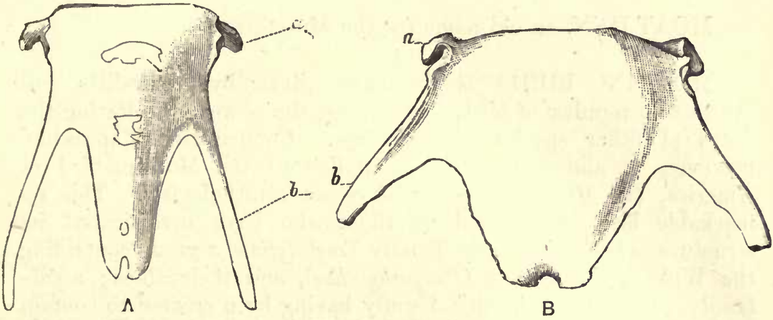

Fig. 3. STERNUM of *Anomalopteryx casuarina* (A), and *Pachyornis elephantopus* (B), 1/6. *a*, Costal process; *b*, Lateral process. (From the same work.)

Von Haast proposed the name *Euryapteryx* for the small and broad-beaked *D. gravis*, Owen. This species, which is confined to the South Island, is distinguished from those that follow by the absence of any inflection of the lower end of the tibia, and the relative length and straightness of that bone. It therefore seems to be entitled to generic distinction.[2] If, therefore, the so-called *D. crassus* really have a broad-beaked skull, both that and the present species may be included under the title of *Emeus*.

Lastly we have the genus *Pachyornis*, Lydekker, likewise typically confined to the South Island, and including some three or four species of large size, characterized by the extraordinary massiveness and sharpness of their limb-bones. The tarso-metatarsus (fig. 2, A) presents a remarkable contrast to the corresponding bone of *Dinornis* (fig. 2, B); and a similar contrast is exhibited by the tibiæ of the two genera, that of *Pachyornis* being further distinguished from the corresponding bone of all the preceding members of the Family by the inflection of its distal end. The sternum (fig. 3, B) is likewise very different from that of the other forms, being very wide and flat, with broad and divergent lateral processes. The skulls found with the limb-bones of *P. elephantopus* near Oamaru Point, and transmitted with them to the British Museum, have pointed beaks, and there is much probability of their reference to this species by Owen being correct. *P. elephantopus*, of which the remains, often charred by fire, are extremely abundant near Oamaru Point, was a large species, the tibia measuring 24 inches in length; but *P. immanis* was still larger, with a remarkably wide tarso-metatarsus. R. LYDEKKER.

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[1] It is doubtful if this skeleton is altogether authentic.

[2] According to Von Haast it is further distinguished by having a sternum of the type of *Anomalopteryx*, but Capt. Hutton throws some doubt on the correctness of the restoration of the skeleton by Von Haast.

MOAT-HEN, an old name for the MOOR-HEN.

MOCKING-BIRD[1] is the name given by naturalists and others to a number of birds that possess the power of imitating the notes of other species of the Class. Comparatively speaking, however, it almost exclusively applies to the Mocking-bird of America, the *Mimus polyglottus* of recent ornithologists. This remarkable bird is regarded by those who have investigated its structure as belonging to the Family *Troglodytidæ*, a group containing the WRENS, THRASHERS (*Harporhynchus*), and their allies; a subfamily, *Miminæ*, within this Family having been created to contain such birds as are represented in the United States by the last-named genus, as well as the genera *Oreoscoptes*, *Mimus* and *Galeoscoptes.*[2]

The most THRUSH-like forms among the *Troglodytidæ* are more or less closely related to the *Turdidæ*, the Family containing the typical Thrushes, and none more so than are the several genera above named. Indeed, many ornithologists regard the *Miminæ* as being aberrant *Turdidæ*, the former possessing tarsi anteriorly scutellate, while the latter are characterized by having the tarsal theca fused into one solid, smooth sheath in front. It is as well to observe here, however, that in *Galeoscoptes* the scutellæ of the tarsus are sometimes quite obsolete. Osteologically the *Miminæ*, Thrushes and Wrens possess apparently distinguishing characters of about equal rank and strength, while in some particulars the several genera almost seem to intergrade where the affinities are most closely drawn. From some cause or another, not yet fully determined, adult Mocking-birds vary considerably in size, especially in length, several apparently full-grown males ranging from 9½ to 11 inches; and it is also a well-known fact that they likewise vary greatly in their powers of song.

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[1] For this article on a subject which can only be fitly treated by an American ornithologist I am again indebted to Dr. Shufeldt. The earlier English naturalists, Charleton, Ray and Catesby wrote the name "Mock-bird"; and in England either form, or more often "Mock-Nightingale," is occasionally given to the BLACKCAP, *Sylvia atricapilla*, and the SEDGE-BIRD. In India and Australia the name is sometimes applied to other species, and even in North America two Wrens, *Thryothorus ludovicianus* and *T. bewicki* seem to be widely known as "Mocking-birds."—A. N.

[2] In this connexion see the paper by Mr. F. A. LUCAS entitled *Notes on the Osteology of the Thrushes, Miminæ, and Wrens* (*Proc. U. S. Nat. Mus.* vol. xi. 1888), and two papers by the present writer, viz. *On the Position of Chamæa in the System* (*Jour. Morph.* vol. iii. No. 3, 1889, pp. 475-502), also *Contributions to the Comparative Osteology of the Families of North American Passeres* (*Jour. Morph.* vol. iii. No. 1, 1889, pp. 81-114).

Although exceedingly plain in the coloration of his plumage, the Mocking-bird is a strikingly handsome and graceful bird. This is largely due to the ease and elegance of his every movement, his neat appearance, and a certain decisive dignity in all his actions. His eye is full of animation, and his constant bearing full of energy. The sexes differ but little in colour or size, the female being rather browner and at the same time smaller, while young birds are speckled below with dusky, as is the case in the majority of young *Turdidæ*. An adult male is of an ashy-grey above, and a dingy white below. A large white space marks the blackish-brown wing, and the outer tail-feathers are also white, the remainder of the tail being black, the feathers tipped with white, the same being graduated from without towards the middle pair of usually wholly black feathers. The bill and feet are likewise black, and the irides of a fine golden cream-colour. In form, the bird is trim and Thrush-like, the tail being rather long and cuneiform.

The habitat of this species may be said to extend across the entire breadth of the United States, and south into Mexico; but north of the 38th parallel the bird becomes rare. Over this wide range the food of the Mocking-bird varies somewhat, although it may be broadly said that it everywhere consists largely of many of the smaller fruits, insects and some seeds. In some respects its nidification agrees with the typical Thrushes, the nest being placed without much regard to concealment in some bush or low tree; being bulky, and built of twigs, dried leaves, fine fibrous roots, and sometimes to these are added wool or tow when procurable. The eggs are from four to six, bluish-green in colour, freckled with blotches of various shades of yellowish-brown. Two broods may be reared in the season, and in the southern States sometimes even three. Very often the nest of the Mocking-bird is attacked by various species of snakes, more especially the black-snake (*Bascanium constrictor*), which is very partial to the eggs and young of this and other birds. These attacks are met by *Mimus* with conspicuous courage, and the intruder is frequently compelled to withdraw, while the victorious bird announces the result of the encounter with a perfect medley of his richest vocalizations, which are usually poured forth from the top of the tree or bush containing his nest.

Were what we have given in the foregoing account of the Mocking-bird all that goes to make up his life-history, he would pass among his Class as a very ordinary representative of it indeed; it is not, however, for any of the traits or habits thus far enumerated that he has become one of the most famous of his tribe. He is, as every student of nature knows, one of the most extraordinary songsters of the entire world's avifauna. As an imitator of the songs or cries of every other species of bird he has ever listened to, the Mocking-bird probably stands without a rival in the entire Class, but in addition to this power he possesses native notes of great purity, strength, energy, and sweetness. To some degree these latter resemble the notes of the Brown Thrasher, *Harporhynchus rufus*, but are of greater variety and far richer.

For thorough appreciation, one should catch him upon a dewy morning just as the sun rises, and he flits to the top of some low tree to pour forth his medley of carols in soul-felt welcoming. This may be in some quarter of the sunny south, perhaps near the manor-house of some broad plantation, where not only can he imitate any individual of the host of native songsters about him, but vary the strain with any of those familiar sounds heard about the house and barn-yard. To see that little feathered being so brimful of ecstasy, replete with action and animation, drooping his wings, spreading his tail, so buoyant as hardly to be able to retain his perch, while the air is actually filled with his inimitable musical performances, is a sight not likely to be forgotten. Clearly, and with the greatest possible accuracy and rapidity, and with a mellow strength even exceeding the originals, he utters the notes and calls of twenty or more birds in succession, ranging all the way from the plaintive air of the Blue-Bird to the harsh, discordant cries of Jays, Sparrow-Hawks, and even with equal compass the vociferations of an Eagle. Catching breath, and tossing himself lightly into the air above his perch, he alarms the entire feathered community assembled by his imitating the cries of a wounded birdling in the talons of a Hawk; this is followed perhaps by the crowing of a Cock or the vociferous note of the Whip-poor-will, and the very incongruity appears to put his feathered listeners to shame at the hoax.

Caging seems hardly to diminish his powers, and he will sing with the greatest energy the best part of a moonlit night, as lustily as though he were free in his native haunts. But enough: to have one appreciate the Mocking-bird he must be heard, and he must be heard under all circumstances where he best loves to dwell. To compare him with his only rival, the European Nightingale, seems to me quite out of place, though I will say that my faith in the powers of the Mocking-bird is so firm, that I believe were he successfully introduced into those countries where the Nightingale flourishes, that princely performer might some day wince as he was obliged to listen to his own most powerful strains poured forth with all their native purity by this king of feathered mockers, the subject of the present notice.

In America there are no other birds that at all deserve the name of a Mocking-bird. The Magpie often imitates bits of human speech with great accuracy, while the CAT-BIRD sometimes makes a feeble effort to bring out the notes of some of the smaller birds, but they are not to be thought of in connexion with the powerful productions of *Mimus polyglottus*, while the cat-like mewing note of the former is not in imitation of that animal at all, but only an accidental vocal resemblance.[1]

R. W. SHUFELDT.

MOLLY and MOLLY-MAWK, corruptions of MALLEMUCK, applied by modern seamen to the smaller kinds of ALBATROS.

MONAL or MOONAUL (Hind. *Munál*),[2] the Anglo-Indian name for birds of the genus *Lophophorus*, some of the largest of the

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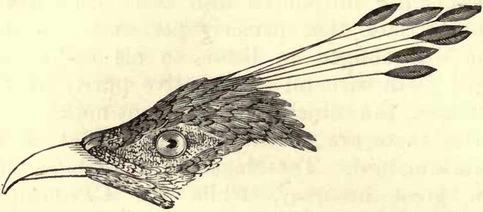
[1] Some twelve or fourteen other species of *Mimus* have been recognized, mostly from South America, where the name of "Calandria" (Lark) is often applied to them, and Mr. Hudson's account (*Argent. Orn.* i. pp. 5-11) of the three inhabiting the portion of that continent treated of by him is well worth attention; but *M. orpheus* seems to be common to some of the Greater Antilles, and *M. hilli* is peculiar to Jamaica, while the Bahamas have a local race in *M. bahamensis*. The so-called Mountain Mocking-bird, *Oreoscoptes montanus*, is a form not very distant from *Mimus*; but, according to Mr. Ridgway, it inhabits exclusively the plains (overgrown with *Artemisia*) of the interior tableland of North America, and is not at all imitative in its notes, so that it is an instance of a misnomer. Of the other genera allied to *Mimus*, those known in the United States as THRASHERS, and belonging to the genus *Harporhynchus*—of which six or eight species are found in North America, and are very Thrush-like in their habits—have been mentioned above; but there is only room here to dwell on the CAT-BIRD, *Galeoscoptes* or *Mimus carolinensis*, which is an imitator of many sounds, with at the same time peculiar notes of its own, from one of which it has gained its popular name. The sooty-grey colour that, deepening into blackish-brown on the crown and quills, pervades the whole of its plumage—the lower tail-coverts, which are of a deep chestnut, excepted—renders it a conspicuous object; and though, for some reason or other, far from being a favourite, it is always willing when undisturbed to become intimate with men's abodes. Besides its range on the American continent it is one of the few species that are resident in Bermuda, while on more than one occasion it is said to have appeared in Europe, though whether as an unaided visitor may be doubted.—A. N.

[2] See Yule and Burnell, *Hobson-Jobson*, pp. 443, 444.

Phasianidæ, the Impeyan PHEASANTS of many writers, so called because one of them was introduced to notice by Sir Elijah and Lady Impey on returning from India in 1784.[1] But the species thus made known, the true *L. impeianus*, seems to have a restricted range in southern Cashmere (Chamba), and is not common in collections, a nearly allied one, *L. refulgens*, which frequents the forests of the southern slopes of the Himalayas, from eastern Affghanistan to western Bhotan, being generally mistaken for it.[2] Its habits, described by Mr. Frederic Wilson, writing in 1848, as "Mountaineer" in *The India Sporting Review* (viii. pp. 143-148), and quoted by Jerdon (*B. Ind.* iii. pp. 511-515), are completely those of an ordinary Pheasant, though it often shews a greater partiality for perching upon a tree when made to take wing. In some districts it seems to have been extremely numerous not so many years ago, but there is reason to fear that, in spite of the well-intended action of the Indian Government, this is not so now; for the cocks have been killed by thousands to meet the "plume" market, and their refulgent feathers are not only largely used by women to bedizen their persons, but also in the construction of fans, screens and the like. The hens are fortunately without special adornment, and carry on their maternal duties comparatively unmolested in a modest attire admirably adapted to concealment, and in strong contrast to the brilliant hues of their mates, whose plumage of shining green and blue over nearly the



LOPHOPHORUS REFULGENS. (After Swainson.)

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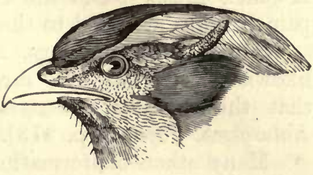
[1] Cuvier in 1829 (*Règne Animal*, ed. 2, i. p. 474), and after him Yule (*Marco Polo*, i. p. 248), believe that it was described by Ælian (*Nat. Anim.* xvi. 2), but what the last says of his "Great Indian Cock," though in several respects fitting the Monaul, seems too vague to make this certain. Some suppose that Ælian took his information from Ctesias, but the fragments of the latter speak only (*Indica*, cap. 3) of very big Indian Cocks, a MS. at Munich reading, according to P. J. C. F. Bähr (Francof. a/M. : 1824, p. 269), *ἀλεκτρυόνες ὡς πρόβατα—cocks as big as sheep*! Mr. M'Crindle, in his edition of Ctesias (Bombay: 1882, p. 36, note), also thinks he had this bird in view, but woefully misspells its scientific name.

[2] *L. impeianus* has the lower part of the back and body generally of a golden-green, while in *L. refulgens* the former is white and the latter black. The correction of the common mistake is due to Mr. Ogilvie-Grant (*Cat. B. Br. Mus.* xxii. p. 278), and is the more welcome since the original species had been redescribed (*Ibis*, 1884, p. 421, pl. x.) under the new name of *L. chambanus*.

whole body, with a gleam of gilded purple on the nape, a snowy-white rump and rufous tail, offer a marvellously bright combination of colours. Another striking feature is the crest of feathers formed almost like those of the common Peacock, and this crest is possessed also by the true *L. impeianus*. In Assam a third species, *L. sclateri*, is found (*Proc. Zool. Soc.* 1870, pl. xiv.; 1879, pl. li.) crestless, and having the tail white with a broad reddish bar near the tip; while a fourth, *L. l'huysi*, having a crest of ordinary feathers, and a dark glossy green tail (*op. cit.* 1868, pl. i.), inhabits Moupin. Other species may not unlikely reveal themselves as the North-eastern portion of the Indian Region is explored. According to Jerdon (*op. cit.*), one of the Horned Pheasants, *Tragopan* or *Ceriornis satyrus*, is also called "Monaul" by Europeans at Darjiling.



TRAGOPAN SATYRUS.
(After Swainson.)

MONK, a name in some parts of England for the cock BULLFINCH, and in Australia one of many applied to the FRIAR-BIRD.

MONSTROSITIES are naturally more observed in domesticated than in wild Birds, and are more commonly cases of excessive than of arrested development. The former may be restricted to overgrowth of otherwise small parts, such as double feathers, or may amount to the addition of a whole limb, or even still greater portion of the body. Frequently such supernumerary parts seem due to an early splitting of the affected member in the embryo, but whether caused by mechanical injury or due to an unusual activity of the growing and multiplying cells it is of course in most cases impossible to say. As a rule, such abnormalities are purely pathological, and not indicative of ancestral conditions, though cases are known in which latent germs have certainly been awakened and given rise to organs or parts of organs that in normal individuals of the species are either absent or rudimentary.

Supernumerary toes, as in the Dorking Fowl, are of common occurrence. In these cases the additional toe is generally the result of the HALLUX being split into two, and not the real fifth toe, which was long ago completely lost by the Reptilian ancestors of Birds.

Three legs are very frequent; the third limb, which is generally smaller and with crippled toes, being attached to the caudal vertebræ, to the pelvis, or even to the femur of one of the proper legs. Such cases have been many times recorded in the Duck, Fowl, Sparrow and other common birds, while Lidbeck long ago described (*K. Vetensk. Acad. Handl.* 1762, p. 164) an adult Eagle with three feet, of which the superfluous foot was placed between the other two and bore seven toes. A more recent and somewhat similar instance is described by Mr. H. K. Coale (*Auk*, 1887, p. 332), in which a superfluous toe was loosely attached to the muscles of the thigh of a *Buteo latissimus*.[1] Monstrous examples with four legs are known in Fowls, Pigeons, Geese, Sparrows and the Goldfinch, the supernumerary pair being sometimes correlated with a double vent. A Chick preserved in the Cambridge Museum has the additional pair of limbs attached to the end of the stunted tail.

Supernumerary wings, articulating below the normal wings, likewise occur, but very rarely except the legs be also doubled, so that the monster possesses eight limbs (Tiedemann, *Anat. und Naturgesch. Vögel*, ii. p. 273).

Many other malformations may be seen in various Museums, but only a few need be here mentioned—such as Chicks with two bills, three wings and four legs; Geese, Pigeons, and Pheasants with two or three bills; Chicks, Ducklings and Pigeons with two heads. Occasionally considerable portions of the trunk are affected by duplicity, producing not only two heads and necks, but two vertebral columns and two bellies. Two hearts, within otherwise normal bodies, have also been described in adult Fowls, Turkeys and Geese. The Cambridge Museum possesses a nearly adult example of a Duck which beside the two normal and functional legs has an extra right leg of the same size as the others, but ending in five complete toes. Another immature Duck has a cleft in the middle line of the sternum, separating it together with the keel into a right half and a left, in this respect continuing the embryonic condition. Similar cases of arrested development are common, and one, of a Pigeon, has been figured (*Phil. Trans.* 1869, pl. xxiii. fig. 172). In the same Museum is an adult male Turnstone (*Strepsilas interpres*), which was in perfect plumage when killed, with only one leg, and not the least trace, as ascertained on dissection, of the other. Fowls may have their toes more or less united by a web, and Ducks be without any web between their toes; the last case is of some curiosity, insomuch as such birds, as they swim, close their toes during the back stroke, thus adapting themselves to their abnormal condition.

Questions relating to abnormal excess of structure form what is called Teratology, on which the works of M. Camille Dareste[2] and Mr. Bateson[3] may be profitably studied. The former comes to the following conclusions:—Abnormalities are always due to modifications of the early embryonic development. Multiple heads are the result of arrested development of the anterior cranial vesicle. Irregular growth of the AMNION frequently has a disturbing influence upon various parts of the embryo, and thus abnormalities of the tailfold (EMBRYOLOGY, p. 201) produce hind limbs abnormal in shape and position, a crooked vertebral column and so on. Double or treble monsters, partial or even perfect twins, or triplets, may be due to any one of three causes:—two or three yolks, each with its own blastoderm (p. 200) in one common shell; two blastoderms with one yolk; or one blastoderm upon a single yolk, split by a subsequent injury, each portion of it producing a more or less complete counterpart of an embryo or portion of it. M. Dareste has been able to shew beyond doubt that portions of the blastoderm artificially split off, or even parts of more advanced embryos will occasionally continue growing into a part at least of that organ, of which the respective embryonic cells were the normal substratum; in the case of two blastoderms upon a single yolk, complete though more or less united embryos will be the result. According to the present state of our knowledge it is not justifiable to explain partly multiple monstrosities by the assumption of a fusing of originally separate embryos, but by a splitting of the blastoderm, and if that takes place very early and is complete, each of its halves, which in Mammals have little or no yolk, may produce an independent embryo, so that in such a case the flippant saying that "A twin is only the other half" happens to be true.

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[1] The same gentleman also records a *Dolichonyx oryzivorus* having a horny spur, of which he gives a figure (*tom. cit.* p. 333), "growing from the thumb tip" of each wing. This may be compared with the examples already cited (CLAWS, pp. 89, 90), but they scarcely belong to the category of Monstrosities.—A. N.

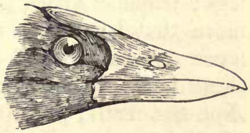
[2] *Recherches sur la production artificielle des monstruosités*, ou essai de Tératogénie expérimentale. Paris: 1877.

[3] *Materials for the Study of Variation.* London: 1894.

MOOR-BUZZARD, the common name in England, in days when the bird was not scarce, for what is called in books the Marsh-HARRIER.

MOOR-COCK, MOOR-FOWL and MOOR-POULT, old English names of the bird now well known as the Red GROUSE; but

MOOR-HEN is the commonest name of a common bird, often called Water-hen, and in books sometimes Gallinule. An earlier English name was Moat-hen, which was appropriate in the days when a moat was the ordinary adjunct of most considerable houses in the country, and this species its ordinary denizen. It is the *Gallinula chloropus* of ornithologists, and so well known as hardly to need description. About the size of a small Bantam-hen, but with the body much compressed, as is usual with members of the Family *Rallidæ* (RAIL) to which it belongs, its plumage above is of a deep olive-brown, so dark as to appear black at a short distance, and beneath iron-grey, relieved by some white stripes on the flanks, with the lower tail-coverts of pure white—these last being very conspicuous as the bird swims. A scarlet frontlet, especially



MOOR-HEN. (After Swainson.)

bright in the spring of the year, and a red garter on the tibia of the male render him very showy. Though often frequenting the neighbourhood of man, the Moor-hen seems unable to overcome the inherent stealthy habits of the *Rallidæ*, and hastens to hide itself on the least alarm; but under exceptional circumstances it may be induced to feed, yet always suspiciously, with tame ducks and poultry. It appears to take wing with difficulty, and may be often caught by an active dog; but, in reality, it is capable of sustained flight, its longer excursions being chiefly performed by night, when the peculiar call-note it utters is frequently heard as the bird, itself invisible in the darkness, passes overhead. The nest is a mass of flags, reeds, or other aquatic plants, often arranged with much neatness, almost always near the water's edge, where a clump of rushes is generally chosen; but should a mill-dam, sluice-gate, or boat-house afford a favourable site, advantage will be taken of it, and not unfrequently the bough of a tree at some height from the ground will furnish the place for a cradle. The eggs, from seven to eleven in number, resemble those of the COOT, but are smaller, lighter, and brighter in colour, with spots or blotches of reddish-brown. In winter, when the inland waters are frozen, the majority of Moor-hens betake themselves to the tidal rivers, and many must leave the country entirely, though a few seem always able to maintain their existence however hard be the frost. The common Moor-hen is widely spread throughout the Old World, being found also at the Cape of Good Hope, in India, and in Japan. In America it is represented by a very closely-allied form, *G. galeata*, so called from its rather larger frontal helm, and in Australia by another, *G. tenebrosa*, which generally wants the white flank-markings. Both closely resemble *G. chloropus* in general habits, as does also the *G. pyrrhorrhoa* of Madagascar, which has the lower tail-coverts buff instead of white. Celebes and Amboyna possess a smaller cognate species, *G. hæmatopus*, with red legs; tropical Africa has the smallest of all, *G. angulata*; and some more that have been recognized as distinct are also found in other more or less isolated localities. One of the most remarkable of these is *G. nesiotis*, the "Island Hen" of Tristan da Cunha (*Proc. Zool. Soc.* 1861, p. 260, pl. xxx.), which has wholly lost the power of flight concomitantly with the shortening of its wings and a considerable modification of its external apparatus, as well as a strengthening of its pelvic arch and legs.[1] The same is to be said of the "Mountain Cock" of Gough Island, the *Porphyriornis comeri* of Mr. Allen (*Bull. Am. Mus. N. H.* iv. pp. 57, 58), who has instituted for it a new genus, to which he also refers the preceding bird. A more extreme development in this direction appears to be exhibited by the singular *Habroptila wallacii* of Gilolo (*Proc. Zool. Soc.* 1860, p. 365, pl. clxxii.), and to some extent by the *Pareudiastes pacificus* of Samoa (*op. cit.* 1871, p. 25, pl. ii.), but at present little is known of either. Of other forms, such as the common *Gallinula* (*Erythra*) *phœnicura* and *Gallirex cinerea* of India, as well as the South-American species classed in the genus *Porphyriops*, there is not room to speak; but mention must be made of the remarkable Australian genus *Tribonyx*, containing three species (*Ann. & Mag. N. H.* ser. 3, xx. p. 123), called by the colonists "Moor-hen" and "Native Hen," which seem to be more terrestrial than aquatic in their haunts and habits.

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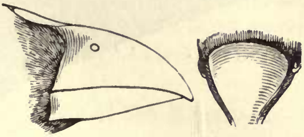
[1] A somewhat intermediate form seems to be presented by the Moor-hen of the Island of St. Denys, to the north of Seychelles (*Proc. Zool. Soc.* 1867, p. 1036; *Trans. Norf. & Norw. Nat. Soc.* iv. p. 552, note), hitherto undescribed, and accordingly now named by me *Gallinula dionysiana*.

Allied to all these is the genus *Porphyrio*, including the bird so named by classical writers, and perhaps a dozen other species often called Sultanas and Purple Water-hens, for they all have a plumage of deep blue—some becoming violet, green, or black in parts, but preserving the white lower tail-coverts so generally characteristic of the group; and their beauty is enhanced by their scarlet bill and legs. Two, *P. alleni* of the Ethiopian Region and the South-American *P. parva*, are of small size. Of the larger species, *P. cæruleus* seems to be the "Porphyrio" of the ancients, and inhabits certain localities on both sides of the Mediterranean, while the rest are widely dispersed within the tropics, and even beyond them, as in Australia and New Zealand. But this last country has produced a more exaggerated form, *Notornis*, which has an interesting and perhaps unique history. First described from an imperfect fossil skull by Owen (*Proc. Zool. Soc.* 1848, pp. 2, 7; *Trans.* iii. p. 366, pl. lvi.), and at that time thought to be extinct, an example was soon after taken alive (*Proc.* 1850, pp. 209-214, pl. xxi.; *Trans.* iv. pp. 69-74, pl. xxv.), the skin of which (with that of another procured like the first by Mr. Walter Mantell) may be seen in the British Museum. Other fossil remains were from time to time noted by Prof. Owen;[1] but it began to be feared that the bird had ceased to exist,[2] until a third example was taken about the year 1879, the skin and most



PORPHYRIO. (After Swainson.)

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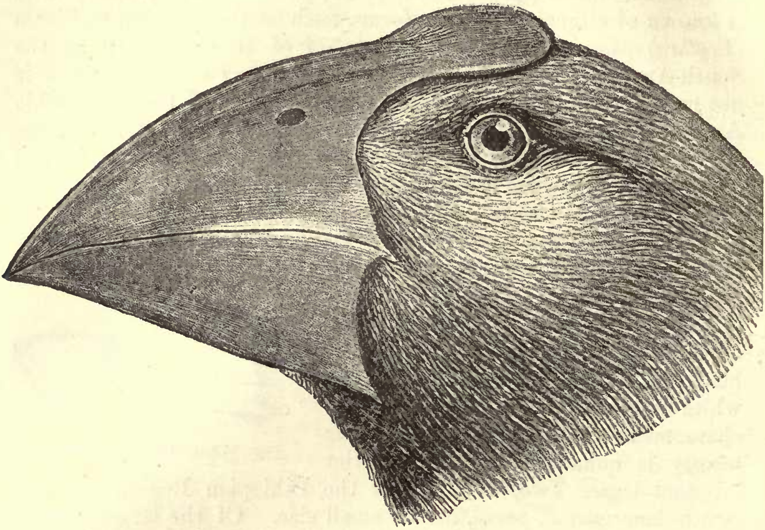
[1] Thus the leg-bones and what appeared to be the sternum were described and figured by him (*Trans.* iv. pp. 12, 17, pls. ii. iv.), and the pelvis and another femur (vii. pp. 369, 373, pls. xlii. xliii.); but the supposed sternum subsequently proved not to be that of *Notornis*, and the author's attention being called to the fact (*Proc.* 1882, p. 97) he rectified the error (*tom. cit.* p. 689) which he had previously been "inclined to believe" (*Trans.* viii. p. 120) he had made.

[2] Notwithstanding the statement, which certainly presented some incongruities, made by Mr. Mackay (*Ibis*, 1867, p. 144).

of the bones of which, after undergoing examination by Sir W. Buller and Prof. T. J. Parker (*Trans. N. Zeal. Inst.* xiv. pp. 238-258), are now in the museum of Dresden, where Dr. A. B. Meyer declared the recent remains to be specifically distinct from the fossil, and while keeping for the latter the name *N. mantelli* gave the former that of *N. hochstetteri.* A third species ascribed to the genus, *N. alba,* is said to have once inhabited Lord Howe's and Norfolk Islands, but is now extinct, a specimen at Vienna (*Ibis,* 1873, p. 295, pl. x.) being its sole remains.[1]



NOTORNIS. Natural size. (From Buller.)

MOOR-TITLING, a common local name in Scotland and the North of England for the TITLARK.

MOORUK, the native name of the species of CASSOWARY peculiar to New Britain, and adopted as an English word.

MOOSE-BIRD, a name for the Canada JAY.

MOREPORK, in New Zealand the name of an OWL, *Spiloglaux novæ-zealandiæ,* but in Tasmania that of *Podargus cuvieri* (NIGHTJAR), in each case from the cry of the bird.

MORILLON, a name commonly given by fowlers to the female and immature male of the GOLDEN-EYE, the *Clangula glaucion* of modern ornithology, under the belief which still very generally obtains among them, as it once did among naturalists, that they formed a distinct species of Duck. The mistake no doubt originated in, and is partly excused by, the facts that the birds called Morillons were often of opposite sexes, and differed greatly from the adult male Golden-Eye, whose full and beautiful plumage is not assumed until the second year. The word is used in French in precisely the same form, but is in that language applied to the Tufted Duck, *Fuligula cristata*, and is derived, according to Littré, from *more*, signifying black.

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[1] The genus *Aptornis,* of which Prof. Owen described the remains from New Zealand as nearly allied to *Notornis* and *Porphyrio,* is considered by Prof. T. J. Parker (*loc. cit.*) to be a "development by degeneration of an ocydromine type," and Mr. Lydekker (*Cat. Foss. B. Br. Mus.* p. 147) speaks of it as "allied to *Ocydromus*" (WEKA).

MOSQUITO-HAWK, a name in America for the species of *Chordiles* (NIGHTJAR).

MOSS-CHEEPER, a north-country name of the TITLARK.

MOTHER CAREY'S CHICKEN, GOOSE and HEN—sailors' names, the first of any of the small black or black and white PETRELS, the second of the Giant Petrel, *Ossifraga gigantea*, and the third seems to be applied without much discrimination to any Petrel of middle size.

MOTH-HAWK, MOTH-HUNTER, names of the NIGHTJAR.

MOTMOT, according to Hernandez in his *Historia Avium Novæ Hispaniæ* (p. 52), published at Rome in 1651, was the Mexican name of a bird which he described well enough to leave no doubt as to what he meant; but the word being soon after printed *Momot* by Nieremberg and others gave rise to the Latinized *Momotus*, invented by Brisson as a generic term, which has since been generally adopted by ornithologists,[1] though Motmot has been retained as the English form. Linnæus knew of only one species of Motmot, and referred it to his genus *Ramphastos* (TOUCAN) under the name of *R. momota*. This is the *Momotus brasiliensis* of modern ornithologists, and from its geographical range cannot be the original *Motmot* of Hernandez, but is most likely the "*Guira guainumbi*" of Marcgrave.

The Motmots have been for many years recognized as forming a distinct family, *Momotidæ* or *Prionitidæ*, of the heterogeneous assemblage known as *Picariæ* or *Coccygomorphæ*; and the only question among systematists has been as to their position in that group. This has been discussed and illustrated with his usual assiduity by Dr. Murie (*Ibis*, 1872, pp. 383-412, pls. xiii.-xv.), who conclusively shewed that *Todus* (TODY) was the Motmot's nearest existing relative, while he believed that both *Momotidæ* and *Todidæ* might be placed in one section (*Serratirostres*) with the *Coraciidæ* (ROLLER), *Meropidæ* (BEE-EATER), and *Alcedinidæ* (KINGFISHER). To the latter allocation Garrod (*Proc. Zool. Soc.* 1878, pp. 100-102) partly demurred, though admitting the Kingfisher affinity, while upholding the former, and even declaring that Motmots and Todies form but a single Family. As the conclusions of both these investigators are based on the sure ground of anatomical structure, they are of incomparably greater value than most of those arrived at by prior systematists who judged from external characters alone.

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[1] Its barbarous origin induced Illiger to substitute for it the word *Prionites*, and his example has been followed by some nomenclatural purists.

In outward appearance the Motmots have an undoubted resemblance to the *Meropidæ*, but, though beautiful birds, various shades of blue and green predominating in their plumage, they do not exhibit such decided and brilliant colours; and while the Bee-eaters are only found in the Old World, the Motmots are a purely Neotropical form, extending from southern Mexico to Paraguay, and the majority of species inhabit Central America. They are said to be solitary birds, or at most living in pairs, among the gloomy forests, where they sit on the underwood nearly motionless, or only jerking their long tail as the cry "houtou" (or something like it) is uttered. Their ordinary food is small reptiles, insects, and fruits. The nest of one species, as observed by Mr. Robert Owen, is at the end of a hole bored in the bank of a watercourse, and the eggs are pure white and glossy (*Ibis*, 1861, p. 65). Little else has been recorded of their ways.

The *Momotidæ* form but a small group, containing, according to the enumeration of them in 1873 by Messrs. Sclater and Salvin (*Nomenclator*, pp. 102, 103), but 17 species,[1] distributed into 6 genera, of which last, however, Dr. Murie (*l.c.*) would only recognize four—*Momotus*, *Baryphthengus*, *Hylomanes*, and *Eumomota*—the second including *Urospatha*, and the last *Prionorhynchus*, while Dr. Sharpe in 1892 (*Cat. B. Br. Mus.* xvii. pp. 313-332) made an additional genus, raising the number of genera to 7 and of species to 18. The distinctions between Dr. Murie's, and still more Dr. Sharpe's groups would require more space to indicate than can here be allowed; but it may be stated that, while all have a general resemblance in the serrated edges of the bill and many other characters, *Momotus* has the normal number of 12 rectrices, while the rest have only 10,[2] which in *Hylomanes* have the ordinary configuration, but in adult examples of all the others the shaft of the median pair is devoid of barbs for the space of about an inch a little above the extremity, so as to produce a spatulate appearance, such as is afforded by certain HUMMING-BIRDS known as "Racquettails," Kingfishers of the genus *Tanysiptera*, and PARROTS of the group *Prioniturus*. Waterton (*Wanderings*, Journey 2, chap. iii.), mentioning the species *M. brasiliensis* by its native name "Houtou," long ago asserted that this peculiarity was produced by the Motmot itself nibbling off the barbs, and this extraordinary statement, though for a while doubted, has since been shewn by Mr. Salvin (*Proc. Zool. Soc.* 1873, pp. 429-433), on Mr. Bartlett's authority, to be perfectly true. The object with which the operation is performed is wholly unknown. It is sometimes incompletely executed, and the tail has then an asymmetrical form. This must have been the case with the example that Hernandez described (*l.c.*), and brought on himself the criticism of Willughby (*Ornithologia*, p. 298) for so doing. Much of the bibliography of the family is given in Dr. Murie's paper already quoted; and it may be remarked that in 1734 Seba, probably misled by wrong information, figured (*Rerum Nat. Thesaur.* tab. 67, fig. 2) under the name of "Motmot" a bird which has been identified with a species of GUAN, and is the *Ortalis motmot* of modern ornithology.

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[1] The same number was recognized by the first-named of these gentlemen in his review of the Family (*Proc. Zool. Soc.* 1857, pp. 248-260), where they are all diagnosed, a species, subsequently described by Dr. Cabanis (*Mus. Hein.* ii. p. 115), not being admitted.

[2] Dr. Sharpe (*l.c.*) makes a different statement, but I believe Dr. Murie, whose reckoning is here followed, to be right.

MOULT,[1] the change of plumage, or shedding of its old and often weather-beaten feathers to be replaced by an entirely new suit, to which almost every individual bird is subject at least once a year, and a process of the most vital consequence, being possibly the severest strain to which the life of each is exposed, for to judge by its effects on those we domesticate, it produces a greater mortality than temporary want of food may do. Important then as is all that relates to the subject, it is yet one that has been sadly neglected by ornithologists, among whom that careful observer the late Herr W. Meves seems alone to have published any extensive series of observations,[2] and it is certainly not to the credit of ornithologists in general, and especially of those who are afforded facilities by Zoological Gardens, that so much ignorance of the process should prevail as undoubtedly is the case, for since his time little advance has been made in our knowledge, so that questions arising out of investigations made by him more than forty years ago remain unanswered and disregarded; and, apart from general works, in which the subject is usually but lightly touched, the literature relating to this branch of ornithology is very small. The structure and mode of growth of FEATHERS has already been sufficiently treated, and here we have briefly to consider the different phases which the act of Moulting offers.

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[1] In Middle English the word (originally a verb) is *mout*, the modern *l* being redundant, and it is derived from the Latin *mutare*, to change.

[2] His valuable paper is in the *Œfversigt* of the Academy of Sciences of Stockholm for 1854 (No. 8), and an English translation of it has been published by Mr. Dresser (*Zoologist*, 1879, pp. 81-89), while a German version containing some modifications and additional matter appears in the *Journal für Ornithologie* for 1855 (pp. 230-238). But the essay treats also of change of colour in feathers apart from moult.

As a general rule all kinds of Birds are subject to an annual Moult, and this commonly begins immediately on the close of the breeding-season, but, as will be presently explained, there are some which undergo in addition a second or even a third partial change of plumage, and it is possible that there may be others still more exceptional: our information respecting these, however, is too meagre to make it worth while saying anything here about them. It must be acknowledged that with regard to the greatest number of forms we can only judge by analogy, and though it may well be that some interesting deviations from the general rule exist of which we are altogether ignorant, yet when we consider that the *Ratitæ*, so far as observed, moult exactly in the same manner as most other birds,[1] the uniformity of the annual change may be almost taken for granted.

It is not intended here to say more (*cf.* p. 248) of the way in which a feather dies and a new one succeeds it, nor need we compare the process of moulting with the analogous shedding of the hair in Mammals or of the skin in Reptiles, though the latter, in the case of the flipper-like wings of the PENGUIN—the scaly feathers of which come off in flakes—Mr. Bartlett (*Proc. Zool. Soc.* 1879, p. 6) has shewn to be remarkably close. Enough for our present purpose to see that such renovation is required in Birds, nearly all of which have to depend upon their quills for the means of locomotion and hence of livelihood. It is easy to understand that durable as are the flight-feathers, they do not last for ever, and are beside very subject to accidental breakage, the consequence of which would be the crippling of the bird.[2] It is obviously to provide against what in most cases would be such a disaster as this last that we find the *remiges*, or quill-feathers of the wings, to be nearly always shed in pairs. They drop out not indeed absolutely at the same moment, though this sometimes seems to happen, but within a few days of each other, and, equilibrium being thus preserved, the power of flight is but slightly deteriorated by their temporary loss. The same may be observed in a less degree, since there is less need of regularity, with the rest of the plumage, as a little attention to any tame bird will shew, and the new feathers grow at an almost equal rate. In the young of most species the original quills are not shed during the first year, nor in the young of many does there seem to be an entire moult during that time, but in the typical *Gallinæ*,[1] which are able to fly at a very early age, often before they are one-third grown, the original quills, being proportioned to the duties required of them, are shed before the bird has attained its full size and are succeeded by others that serve it when it has reached maturity. In the *Anatidæ* and some other groups, however, we have a singular exception to what has been above stated. Most of the former, Ducks, Geese and Swans, shed their quill-feathers all at once, and become absolutely incapable of flight for a season,[2] during which time they generally seek the shelter of thick aquatic herbage,[3] and it is further to be particularly remarked that the males of most of the Family *Anatidæ* at the same period lose the brilliantly-coloured plumage which commonly distinguishes them and "go into eclipse," as Waterton happily said, putting on for several weeks a dingy garb much resembling that of the other sex, to resume their gay attire only when, their new quills being grown, it can be safely flaunted in the open air. Here we have the first instances of Additional Moult to be mentioned. Another is not less interesting, though ornithologists must confess with shame that they have not sufficiently investigated it. This is that of the Ptarmigan, *Lagopus mutus* (p. 392), both sexes of which not only moult after the breeding-season is over into a grey suit, and then again as autumn passes away into their snowy winter-clothing, but, divesting themselves of this last in spring, at that time put on each a third and most distinctive dress—these changes, however, do not extend to the quills either of the wings or tail.[1]

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[1] For the knowledge of this fact I am indebted to the vast experience of Mr. Bartlett.

[2] By an ingenious but simple process known as "imping," which properly means engrafting, and is described in almost every book on hawking, falconers repair any broken flight-feather, and so restore the bird to its full power.

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[1] Nothing seems to be known about the moulting of the young *Megapodiidæ*, and information thereon would be very acceptable.

[2] A Patagonian form, the LOGGER-HEAD (p. 518, No. 3) *Tachyeres cinereus*, seems never to regain the power of flight thus lost (*cf.* Cunningham, *Proc. Zool. Soc.* 1871, p. 262).

[3] It is amusing to find from comments on a paper by the Baron d'Hamonville (*Bull. Soc. Zool. Fr.* 1884, pp. 101-106), that the observation of this fact has been regarded by reviewers and others as a recent discovery. The fact may have been neglected by some writers ; but it was well known to a monk of the 12th century (*Liber Eliensis*, ii. cap. 105), and it is hard to imagine the time when it was not familiar to "divers persons next inhabiting in the countries and places within this realm, where the substance of the same wild-fowl hath been accustomed to breed," for they—to continue the words of an Act of Parliament (25 Hen. viii. cap. 11) passed in 1533—"in the summer season, at such time as the said old fowl be moulted, and not replenished with feathers to fly . . . have by certain nets, engines and other policies yearly taken great numbers of the same fowl, in such wise that the brood of wild-fowl is almost thereby wasted and consumed." It was accordingly declared unlawful to take Wild Ducks or Wild Geese in this manner between the last day of May and the last day of August. Another Act in 1710 (9 Anne, cap. 25, § 4) reinforced this provision for any "Fowl commonly reputed Waterfowl, in any place of resort for wild fowl in the moulting season," and in 1737 (10 Geo. ii. cap. 32, § 10), the close time for moulting waterfowl was extended to the 1st of October.

A similar state of things in the FLAMINGO came under the notice of Pallas (*Zoogr. Ross.-Asiat.* ii. p. 207) who therein is corroborated by Crespon (*Orn. du Gard*, p. 396) ; and, more recently, it has been asserted by M. Gerbe (*Rev. Zool.* 1875, pp. 271-277, pl. vi.) to obtain in the PUFFIN, *Fratercula arctica*, and in the Black-throated DIVER, *Colymbus arcticus*.

The number of Birds which undergo a more or less entire Double Moult is very considerable, and the peculiarity is not always characteristic of Families or even, unless in a very restricted sense, of genera. Thus while the Garden-WARBLER, *Sylvia salicaria*, and the WHITETHROATS, *S. rufa* and *S. curruca*, are said to moult twice in the year the BLACKCAP, *S. atricapilla*, does so but once. The same may be said of the *Emberizidæ* (BUNTING), in which Family both practices seem to obtain, but on the other hand, the distinction in this respect between the *Alaudidæ* (LARK) and the *Anthinæ* (PIPIT), belonging to the Family *Motacillidæ* (WAGTAIL), appears, so far as our knowledge goes, to be invariable, though the habits and general appearance of both groups are so much alike—the *Alaudidæ* moulting but once and the *Anthinæ*, conforming to the practice of the normal *Motacillidæ* (*Motacillinæ*), twice a year—the quills, be it understood, excepted. But it would be impossible here to give more than these few examples, and indeed we scarcely know anything of the subject outside of some groups belonging to the Northern hemisphere.[2]

In a large number of species the Additional Moult is very partial, being often limited to certain portions of the plumage, and it is yet an unsolved problem how far some of the changes to be observed are due to actual Moult and how far to the alteration of colour in the feathers themselves, as also the way by which this alteration of colour is produced, whether, as certainly happens in many instances, by the dropping off of the "barbicels"—the fine filaments that fringe the "barbules," which are arranged on the upper surface of each "barb" composing the web of the feather—or in some other manner. With either of these last considerations we need not now concern ourselves. It is unquestionable that there are innumerable species of birds, the males at least of which put forth in spring decorative plumes unknown at any other season, and it would appear that in some of them the feathers which before clothed the parts whence the newly-donned ornaments grow are doffed to make room for these paraphernalia of marriage.

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[1] Macgillivray (*Brit. Birds*, i. p. 196; and *Nat. Hist. of Deeside*, p. 405) thought there were *four* moults in this species, but that seems to be one too many. Meves (*loc. cit.*) and the Abbé Caire (*Rev. Zool.* 1854, p. 494) independently made the discovery of the Triple Moult, and almost simultaneously announced it (*cf.* Gloger, *Journ. für Orn.* 1856, p. 461).

[2] The fullest list as yet published is that of Meves (*Journ. f. Orn.*, *loc. cit.*), but it is not entirely free from error.

The subject of Additional Moult is thus intimately connected with the seasonal adornment of Birds, and as that properly belongs to a branch of the great question of Natural Selection it could not be suitably entered upon here. The reader is accordingly referred to those excellent chapters in which Mr. Darwin[1] has treated the matter with his usual perspicuity, though even he has far from exhausted its varied points of interest.

It remains to be remarked that though the annual Moult commonly takes place so soon as the breeding-season is over, there are plenty of cases in which the change is delayed to a later period. This is so with the SWALLOW, *Hirundo rustica,* which has long been known to moult in our mid-winter or even later, and it is generally the way with the Diurnal Birds-of-Prey. But unquestionably most birds accomplish the change much earlier, and before they leave their breeding-quarters for their winter haunts, thereby starting on one of their great annual journeys with all the external machinery of flight renewed and in the best condition for escaping its attendant perils.

But the plumage is not the only part of the Bird's integument that undergoes regularly periodical change. Many years ago Nilsson made known by a communication to the annual report of the Academy of Sciences of Stockholm on Zoology for 1828 (pp. 104-106) that in certain species of *Tetraonidæ* (GROUSE) the CLAWS grow to an inordinate length in winter and are partly shed or worn off as spring comes on, and the fact has since received further attention (*cf.* Dresser, *B. Eur.* vii. p. 189, pl. 485). The seasonal elongation of the bill of REDPOLLS during summer, first announced as a conjecture by Gloger (*Journ. für Orn.* 1856, pp. 433-440), had been previously made known to the present writer by Wolley, who first observed it in 1853-4 (*cf.* Yarrell, *Br. B.* ed. 4, ii. p. 139). In both these cases, however, the getting rid of the extraneous growth is to a great extent a mechanical process, and therefore in some measure comparable with the shedding of the fringes of the feathers before mentioned. Not so does it seem to be with others, and a far stranger state of things was revealed by the observation, originally made by Mr. H. G. Palmer about 1865, according to Mr. Ridgway (*U. S. Geol. Explor.* 40*th Parall.* iv. p. 634), who himself confirmed it in countless instances, that irrespective of sex the White PELICAN of North America, during the breeding-season, bears on the ridge of its bill a curious horny projection, flattened at the sides and roughly-triangular in shape, which is worn for about two months only, and then dropping off may be "gathered by the bushel" on the nesting-grounds of the species, as recorded by Baird (*Ibis*, 1869, p. 350). Still more extraordinary was the discovery by Dr. Bureau of the PUFFIN moulting the horny sheath of its BILL, together with the outgrowths over the eyes, while the fleshy rosette at the corner of the mouth shrinks to insignificance, completely changing the bird's physiognomy, and he has since described the same astonishing metamorphosis as existing in other allied forms, including the genera *Chimerina*, *Ombria*, and *Simorhynchus* (*Bull. Soc. Zool. Fr.* 1877, pp. 377-399, pl. v. and 1879, pp. 1-63, pls. i.-vi.) Mr. Harting has given a translation of the first of these papers, with a reproduction of the remarkable plate (*Zool.* 1878, pp. 233-240), and Dr. Coues has published an abstract of both (*Bull. Nutt. Orn. Club*, iii. pp. 87-91, and v. pp. 127, 128).

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[1] *The Descent of Man and Selection in relation to Sex,* chaps. xiii.-xvi. London: 1871.

MOUND-BIRD, a name sometimes given to the MEGAPODES in general, from their mode of nidification, but not applicable to all.

MOUNTAIN-, a prefix to the name of many birds, but often inappropriate, and seldom used except in books, or by persons whose knowledge is thereto limited—thus Mountain-Bunting is the Snow-BUNTING; Mountain-Cock the CAPERCALLY; Mountain-Duck several species of *Anatidæ*—and in New Zealand apparently applied colloquially to *Tadorna tadornoides* (SHELD-DRAKE); Mountain-Finch the BRAMBLING; Mountain-Parrot the *Kea* (see NESTOR); Mountain-Sparrow the Tree-SPARROW, and so on.

MOUSE-BIRD (Dutch *Muisvogel*), the name by which in Cape Colony, Natal, and other parts of British Africa, the members of Brisson's genus *Colius*,[1] Englished COLY in 1773 by Pennant (*Gen. B.* p. 31), are known—partly, it would seem, from their general coloration, but probably more from their singular habit of creeping along the boughs of trees with the whole tarsus applied to the branch. By the earlier systematists, who had few opportunities of examining the internal structure of exotic forms, *Colius* was usually placed among the *Fringillidæ*; but nearly all travellers who had seen one or another species of it in life demurred to that view. Still its position was doubtful till Dr. Murie, in an elaborate treatise on its osteology and systematic place (*Ibis*, 1872, pp. 262-280, pl. x.) shewed that it was no Passerine, and subsequently (*Ibis*, 1873, p. 190, note) proposed to regard the Family *Coliidæ* as the sole representative of a distinct group (PAMPRODACTYLÆ)—this word being coined to indicate the obvious character of all the toes being ordinarily directed forwards, though it is by no means the only peculiar character these birds possess. A few years later most of Dr. Murie's views were confirmed by Garrod (*Proc. Zool. Soc.* 1876, pp. 416-419), who added considerably to our knowledge of the general anatomy of the Family, which he considered to be related on the one hand to the *Picidæ* (WOODPECKER), and on the other to the *Alcedinidæ* (KINGFISHER), and *Bucerotidæ* (HORNBILL). The *Coliidæ* are small birds, with a rather Finch-like bill, a more or less crested head, a very long tail, and are generally of a dun or slate-coloured plumage that sometimes brightens into blue or is pleasingly diversified with white or chestnut. They feed almost wholly on fruits, but occasionally take insects, in quest of which they pass in bands of fifteen or twenty from tree to tree, and hang in all attitudes from the branches as they feed. It is even said that they sleep suspended by their powerful and versatile toes. Ten species are recognized by Dr. Sharpe (*Cat. B. Br. Mus.* xvii. pp. 338-346, and 500), all belonging to the Ethiopian Region (of which the Family is one of the most characteristic), and ranging from Abyssinia southwards. Three species inhabit the Cape Colony.

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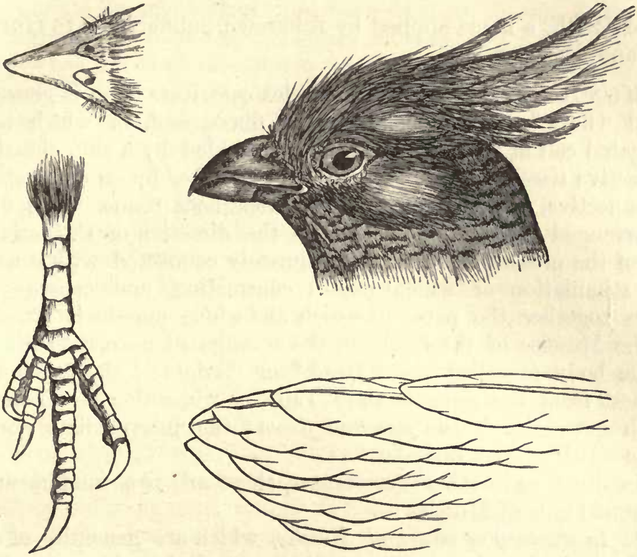
[1] Some other generic divisions have been suggested, but on grounds so slender as hardly to merit consideration.



MOUSE-BIRD. (Partly after Mitchell.)

MUGGY, possibly cognate with the latter part of *Grasmücke* (Grass-Midge), the common German name of the WHITETHROAT, and allied birds; but perhaps only a corruption of MEGGY.

MULLET-HAWK, a name for the OSPREY.

MUMRUFFIN, said to be a local name of the Long-tailed TITMOUSE.

MUNIA, the general name in many parts of India for several kinds of small seed-eating birds, commonly placed in the Family

Ploceidæ (WEAVER-BIRD), which are distinguished for their familiarity with man, their gregarious habits, their depredations on the rice-crops, and their ingenious NESTS, to quote Mr. Hodgson (*Asiat. Researches*, xix. p. 155), who not only Anglified the word but Latinized it, making it the title of a genus to which he assigned three species, while Dr. Sharpe in 1890 (*Cat. B. Br. Mus.* xiii. p. 326) referred to it no fewer than twenty-six. Many of them are among the commonest of exotic cage-birds.

MURRE, a name applied by fishermen indifferently to GUILLEMOT and RAZOR-BILL.

MUSCULAR SYSTEM. Muscles constitute what is generally called "flesh," and are composed of fibres, each of which is an elongated cell of contractile tissue surrounded by a thin sheath of connective tissue, the whole being held together by an outer sheath of connective, and frequently elastic, tendinous tissue. The fibres are arranged with their long axes in the direction of the action or pull of the muscle, and each is intimately connected with a nerve-cell, stimulation of which causes contraction, and consequently draws together the parts to which the whole muscle is attached. In the Muscles of the Skeleton the attachment nearest to the axis of the body is called the "Head" or "origin"; the attachment furthest from the same is the "Tail" or "insertion"—no matter which extremity is the *punctum fixum*: the intermediate portion is the "Belly" or "Body."

In Birds, as in other Vertebrates, there are two fundamentally different kinds of Muscles:—

1. *Involuntary or unstriped Muscles*, which are generally of slow or rhythmical action, such as all those of the viscera, and the true cutaneous Muscles, such as those attached to the root of the feathers.

2. *Voluntary or striped Muscles*, in which each fibre under a microscope seems to consist of a great number of alternate dark and light disks, which cause a transverse striation.

The Muscle of the HEART is in some degree intermediate between those two kinds.

The nomenclature of Muscles has always been difficult. Names like Musculus deltoides or M. gracilis afford no information, and the physiological method of naming a muscle from its function permits only a limited application. The most preferable way is to use a compound word, of which the first portion should indicate the origin, and the second the insertion, further distinction, when needed, being secured by an additional adjective—as M. ilio-tibialis internus. Where the old names of human anatomy can be used without mistaken homology, they may be well applied to Birds, as with M. latissimus dorsi or M. biceps, even though the words M.

spini-humeralis and M. coraco-humero-brachialis would also fix and, moreover, in a measure describe the muscle; but the application of these old names is not always easy, as shewn by the M. supracoracoideus of Birds which really is the modified M. supraspinatus of Man, and has been called the M. pectoralis minor, M. p. secundus, M. p. medius and M. subclavicus; while the M. caudilio-femoralis figures as M. adductor femoris, M. gemellus, M. pyriformis and M. femoro-caudalis—the last being wrong and inappropriate in more than one way—that is to say, it has been mistaken for at least three distinct muscles, and since the nerve-supply has not been ascertained by the writers who employ those names, it is generally doubtful which piece of flesh is intended to be described. Our knowledge of the homologies of avine Muscles may now be regarded as fairly settled by the present writer in Bronn's *Thier-reich* (*Vögel*, pp. 91-325), thanks to the previous labours of Alix, De Man, Fürbringer, Retzius, Rolleston and Rüdinger, and it is based upon their nerve-supply and a study of their origin and insertion in a great number of different Birds.

The taxonomic value of Muscles is theoretically great, but very limited when put to a practical test. Most of them cannot be understood unless the whole group to which they belong be examined, and the study of their correlations is a very complicated problem. To pick out a few of the most variable muscles of the leg, and to arrange Birds according to their mere presence or absence, without regarding intermediate stages, is an easy but scarcely serious mode of investigation, and there is no wonder that systems built on such simple notions broke down. There is no reason why a dozen different kinds of Birds should not have lost the same muscle at different times and independently of each other, and that other kinds may not lose it in future if its function be no longer required or can be fulfilled by some other combination. Similar conditions may possibly have abolished 3 out of the 4 famous thigh-muscles in *Cypselus*, *Trochilus*, *Striges*, *Fregata* and *Accipitres*, and identical circumstances have caused *Dicholophus* and *Serpentarius* to assume the same "myological formula," which in this case means only the loss of the caudal portion of the M. caud-ilio-femoralis! It is certain that similar muscular combinations in two or more Birds do not necessarily mean relationship, while on the contrary similar requirements are often met in similar ways, that is to say the respective organs are "isomorphous" if in two Birds they are modifications of one and the same substratum of the same previous condition, but if identical requirements were in both Birds reached after they had already differed in their substratum, the later requirement would be differently met, and the results would be no longer isomorphous. Thus if in a descendant of the *Passeres* the hallux became reduced and ultimately lost, its so-called "long flexor" muscle would in all likelihood disappear also, because in existing *Passeres* its tendon is unconnected with that of the M. flexor perforans digitorum, while Birds which lost the hallux before these two tendons were disconnected have kept both these muscles.

Prof. Fürbringer, who with enormous labour has exhaustively studied the muscles of the shoulder-girdle, has tabulated the chief characters of 14 muscles selected with a view to taxonomic application, but the results are very small and far less obvious than those afforded by the muscles of hind limbs. The former, as the apparatus of Flight, seem to be more uniformly constructed than the latter, which are more diversified according to the varied uses of the legs and feet. Fluttering, skimming, sailing, soaring are motions much more akin to one another, than climbing, grasping, running, scratching, swimming and wading. The only really aberrant modifications of the wings and their muscles are found in the *Ratitæ*, where they are all easily explained by reduction, and in the *Spheniscidæ*, where bones and muscles are greatly specialized. The modifications of the hind limbs are many times greater—such as extremely long legs, with four, three or only two toes—short or long: very short legs, almost incapable of running or walking, with all four toes directed forwards, or two or one backwards, and two or more connected in various ways.

Most Muscles leave an impression upon the bones to which they are attached, in the shape of ridges, furrows, crests and processes. These marks, small as they often are, are mostly significant, and of greater assistance in the recognition of a bone than its general configuration, as any one will find on trying to determine the kind of bird to which a given bone belongs. The muscles are not as a rule attached to such crests and ridges because these happen to be there, but on the contrary they shape the bone which serves as their passive framework: what is bred in the flesh comes out in the bone, not *vice versâ*. It is the quality not the quantity of an organ that determines its taxonomic value, and adhesion to this principle precludes us from classifying Birds by trim myological formulæ which seem to afford easy keys, but rather obscure than elucidate natural affinities.

Without entering upon genetic and therefore fundamental differences, the voluntary skeletal muscles may be conveniently grouped thus:—

A. Muscles supplied by spinal nerves.
  α. Muscles of the Stem (neck, trunk and tail).
    1. Dorso-spinal Muscles, supplied by dorsal branches.
    2. Ventri-spinal Muscles, supplied by ventral branches.
  β. Muscles of the extremities (limbs) supplied by ventral branches.

B. Muscles supplied by cranial nerves.
  α. Muscles of the Visceral Skeleton.
    1. Muscles of the Jaws.
    2. Muscles of the Hyoid apparatus (page 452).
  β. Muscles of the Syrinx.
  γ. Muscles of the Ear (page 178) and Eye (page 229).

A. The Muscles of the Stem (*A.α*) and of the Extremities (*A.β*) not only exhibit many varieties in different Birds, but they are also very numerous, about one hundred pairs being recognized. To describe them all adequately would go far beyond the scope of this work, while simply to name them and devote a few lines to the general condition of each would, considering their great variability, be of no practical use, for the dissection and recognition of Muscles is not easy. In what follows, therefore, only some of those will be dealt with which, rightly or wrongly, bear the reputation of being of taxonomic value.

Musculus pectoralis, consisting of a thoracic, propatagial and abdominal portion—the first forming the chief muscular mass of the breast and arising from the sternum in the shape of a U—the two arms of which surround the *m. supracoracoideus*, the longer formed by the clavicle, sterno-clavicular membrane and the side of the keel, the shorter by the body and lateral margin and membranes, filling the sternal notches, and adjoining parts of the sternal ribs. All the fibres of this great muscle, which occupies most of the ventral surface of the sternum, converge toward the shoulder into one or two tendons, the principal of which is inserted on the greater tubercle and the upper crest of the humerus, and the muscle is the chief depressor of the upper arm during the down stroke, while it also rotates it forwards. This last is especially its effect in the *Spheniscidæ*, giving their wings the screw-like motion, and is in conformity with the peculiar fact that the tendon of the clavicular portion of the muscle is attached to the whole length of the radial surface of the humerus between its inferior crest and the head. The weight of both the pectoral muscles together is said to amount to about 1/14 in Birds-of-Prey and 1/11 in Wild Geese of that of the whole body.

M. supracoracoideus, arising chiefly from the sides of the angle formed by the keel and body of the sternum, and from part of the coraco-clavicular membrane, and covered by the *m. pectoralis*, ascending from the sternum along the inner and anterior surface of the coracoid, passing by a strong tendon through the *foramen triosseum* and the region over the joint, and inserted on the upper tubercle of the crest of the humerus, which it rotates and abducts. This muscle is generally described as a second pectoral or as the *m. subclavius*; but Alix and Fürbringer have shewn that its

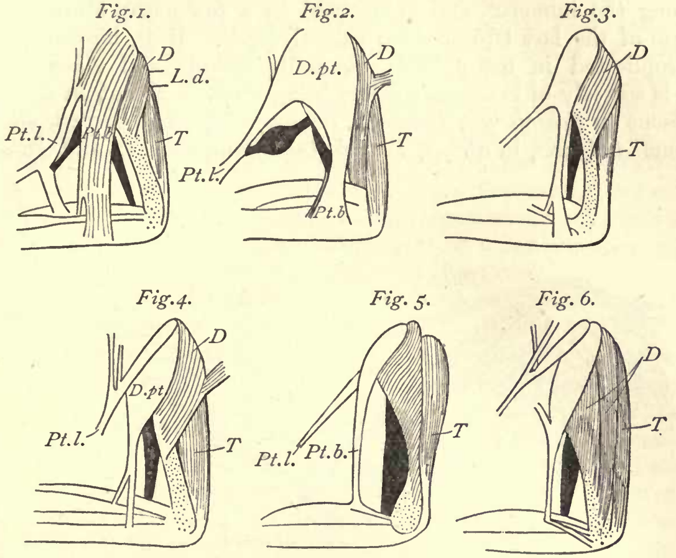
Mammalian equivalent is the *m. supraspinatus.* In *Ratitæ* it arises almost wholly from the coracoid, and scarcely from the sternum: in *Carinatæ* the lateral margin of its sternal origin is marked by a ridge beginning near the coracoid and running parallel to the keel, or converging towards or diverging posteriorly from the latter. The direction and extent of this ridge afford some taxonomic help, as shewn thus:—

Origin of Muscle.	Sternal Ridge.		
	Converging.	Parallel.	Diverging.
From the whole length of the keel.	Spheniscidæ, Tinamidæ, Gallinæ, Limicolæ (*pt.*)	Anseres (*pt.*), Grues, Columbæ, Opisthocomus, Psittaci.	Cypseli, Trochili, Caprimulgidæ.
From half to two-thirds.	Limicolæ (*pt.*), Lari, Anseres (*pt.*), Phœnicopterus, Pelargi, Herodii, Steganopodes, Cathartidæ, Neophron, Striges, Steatornis.		
From the anterior third.	Acciptres (*plurimi*), Colymbidæ, Tubinares.	Passeres (*pt.*)	Picariæ (*plurimæ*), Pici, Passeres (*plurimi*).

M. propatagialis longus, always present, composed of slips from the *mm. deltoides, pectoralis, biceps* and *cucullaris.* Its strong belly originates near the shoulder-joint from the clavicle, scapula and coracoid. Its tendon runs directly to the carpus, forming the outer margin of the patagium or fold of skin between the anterior surfaces of the upper and forearm, which it with the *m. propatag. brevis* serves to extend, and consists of yellow elastic and blue non-elastic fibres, the latter radiating into and being attached to various portions of the patagium. When the wing is extended the elastic portion is stretched to about three times its ordinary length, to which it returns when the wing is folded.

M. propatagialis brevis, composed like the last, absent only in *Apteryx, Casuarius, Dromæus* and the *Spheniscidæ.* In other Birds it is often very complicated—the simplest condition being in the *Pici,* where it consists of a belly and a strong tendon, running down the anterior and outer side of the upper arm, and attached to the proximal tendon of the *m. extensor metacarpi radialis longus,* a little below the outer condyle of the humerus. In *Cuculus* its tendon is attached simply to the ulnar fascia, below the elbow-joint. In most other Birds the tendon is split into several portions, and is further complicated by receiving slips from, and by connexion with the *m. propatag. longus.* Frequently one or more sesamoid bones are intercalated with these tendons, which shew the most complicated arrangement in the *Tubinares.*

Garrod devoted much labour to the elucidation of these patagial muscles, regarding them as of taxonomic value. An obvious and constant character is the presence or absence of a slip from the *m. biceps* to the tendon of the *m. propatag. longus,* and its value may be judged from the following lists:—



Muscles of Left Arm. Lateral View. (After Fürbringer.)

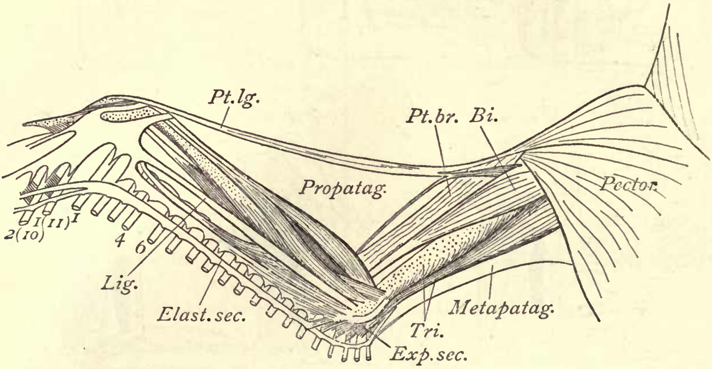
Fig. 1. *Anas*; 2, *Columba*; 3, *Phœnicophæes*; 4, *Upupa*; 5, *Menura*; 6, *Cyanocorax.* *D*, m. deltoides major; *D.pt.* deltoid portion of m. propatagialis; *L.d.* m. latissimus dorsi (portion); *Pt.b.* and *Pt.l.* mm. propatagialis brevis and m. longus; *T*, m. triceps. (The m. biceps with its slip to the m. propatagialis is black.)

Present—*Gallinæ* (excl. *Cracidæ*), *Columbæ, Limicolæ, Laridæ, Alcidæ, Rallidæ, Grues, Tubinares, Colymbidæ, Podicipedidæ, Phalacrocorax, Plotus, Sula, Anseres, Phœnicopterus, Platalea, Caprimulgidæ, Colius.*

Absent—*Ratitæ, Tinamidæ, Turnices, Cracidæ, Otis, Cariama, Spheniscidæ, Phaethon, Fregata, Pelicanus, Palamedea, Herodii, Pelargi, Accipitres, Psittaci, Striges, Picariæ* (excl. *Caprimulgidæ*), *Steatornis, Pici, Passeres.*

M. metapatagialis, formed by slips from the *m. serratus superficialis* and *m. latissimus dorsi,* and with the addition of the *m. expansor secundariorum* extending by its tendons the posterior patagium or fold of skin between the trunk and the inner surface of the upper arm. The *serratus*-portion comes from the ribs and is inserted on the patagium and the last cubital quills, the other splits off from the posterior portion of the *latissimus dorsi* and acts indirectly on the patagium by joining the *m. anconæus longus.*

M. expansor secundariorum or of the cubital quills, arises as a long tendon from the sterno-scapular ligament, passes the axilla, often by a fibrous pulley, accompanies the axillary vessels and nerves along the humerus, and is inserted by a few fleshy fibres on the base of the last two or three cubital quills. It is, however, more complicated in many birds, especially *Gallinæ* and *Anseres*; but it is scarcely of taxonomic value, being weak or absent in *Columbæ*, absent in *Spheniscidæ*, *Tubinares*, *Steganopodes*, some *Herodii*, *Alcidæ*, some *Accipitres*, in *Striges*, *Psittaci*, *Cypselomorphæ*, *Pici* and *Passeres*.



WING MUSCLES OF A GOOSE.

Bi. m. biceps; *Elast. sec.* vinculum elasticum and *Exp. sec.* m. expansor secundariorum; *Lig.* ligament; *Metapatag.* metapatagium; *Pector.* m. pectoralis; *Propatag.* propatagium; *Pt. br.* and *Pt. lg.* mm. propatagialis brevis and longus; *Tri.* m. triceps.

M. flexor digitorum sublimis, arising fleshy from the inner face of the long subcutaneous elastic band that extends from the inner condyle of the humerus along the ventral surface of the ulna to the ulnar carpal, over which the tendon runs and is inserted on the radial anterior side of the first phalanx of the second digit. Owing to the elasticity of the humero-carpal band the wing remains closed without any special muscular exertion, while, when the wing is extended, this band assists considerably in keeping it taut.[1]

M. AMBIENS (page 11), long and spindle-shaped, lying immediately beneath the skin as the most median or internal of all the muscles extending from the pro-acetabular ilium to the knee. When typically developed, it arises with a short tendon from the outer face and the apex of the pectineal process or ilio-pubic spine and runs as a long tendon between the insertion of the *m. sartorius* and the patella over the outer surface of the knee-joint, where it is covered by the origins of the *m. flexor perforans* and *perforatus dig. iii.*, and the *m. perforatus dig. ii.*, then perforating the lateral head of the *m. peroneus superficialis*, it lastly forms one of the heads of *m. flex. perforat. ii.* or *iii.* Its nerve-supply comes from the last branch but one of the middle crural plexus. This muscle is subject to many modifications, and upon their extremes were founded the two groups ANOMALOGONATÆ and HOMALOGONATÆ (see also ANATOMY, page 16). One of the functions of this peculiar muscle, which is similarly developed in Crocodiles, but absent or not differentiated from the ilio-tibial and ilio-femoral mass in other Vertebrates, is that its contraction closes the second and third toes.[1]

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[1] From its position immediately under the skin, this band may be easily cut, and though that operation would cause a drooping of the wing, it would sufficiently hinder its being firmly extended, and thus would be the neatest substitute for the clumsy and barbaric method commonly employed for pinioning Birds. The power of flight is more effectively destroyed if one wing only be operated upon than if both are treated.

M. caud-ilio-femoralis, when fully developed, consists of two parts, inserted by a single strong and ribbon-like tendon near the end of the first third of the hind face of the femur. The caudal part is longer than the other, and arises from the transverse processes of one or more caudal vertebræ passing externally over the distal half of the ischium and pubis. The iliac part, which is the "accessory femoro-caudal" of some writers, is more or less triangular and arises in most cases from the outer face of the distal half or mid-third of the pro-acetabular ilium. This double-headed condition is the most primitive and obtains in most NIDIFUGÆ, but in many of them as well as in many of the NIDICOLÆ either the caudal or the iliac head is absent, though in very few is the whole wanting. The absence of the caudal head may possibly be correlated with the strength of the leg; but these four principal modifications are linked to each other by intermediate stages, which moreover frequently occur in closely-allied genera or even species. Thus the caudal head is very weak in *Œdicnemus superciliaris* and *Œ. bistriatus* and, as Garrod found, does not exist in *Œ. grallarius*. *Dicholophus cristatus*, like *Otis*, has lost it, but *D. burmeisteri* the iliac head as well. In *Ciconia*, the *Striges* and *Cathartidæ* the whole muscle is represented only by the feebly-developed caudal head, and in *Leptoptilus* this also is lost. In some of the *Limicolæ*, for instance *Charadrius pluvialis* and *Vanellus cristatus*, the presence of the iliac head is an individual variation. In *Pedionomus* the iliac head is very large, while the caudal is reduced to a very thin and feeble slip that does not even reach the femur, but merges into the iliac: if this reduction were continued *Pedionomus* would agree with *Pavo* and *Meleagris* and not with *Turnix*, in which the iliac head is absent. Thus the taxonomic value of this muscle may be judged from the following table, shewing its four principal modifications:—

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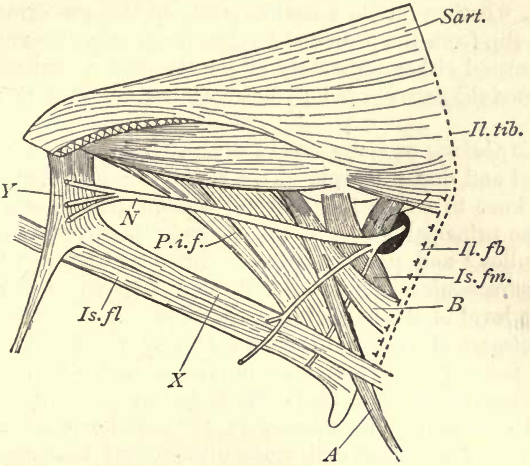
[1] Owen, in 1835, described (*Cyclop. Anat. Physiol.* i. p. 296) the disposition of this muscle, which he called the *gracilis*, as passing "first, over the convexity of the knee-joint, and afterwards over the projection of the heel, [so] that from its connection with a flexor of the toes, these must necessarily be bent simultaneously with every inflection of the joints of the knee and ankle. As these inflections naturally take place when the lower extremities yield to the superincumbent weight of the body, birds are thus enabled to grasp the twigs on which they rest whilst sleeping, without making any muscular exertion." This ingenious explanation of the perching and roosting of Birds was apparently first given by Borelli (*De motu animalium*, Romæ: 1680-82), and has been copied and made much of by many subsequent writers, though Sundevall in 1851 drew attention to the faultiness of the idea, since the *ambiens* muscle is absent in such typical perching Birds as the *Coccygomorphæ* and *Passeres*, while it is present in the *Anseres*. Elsewhere I have pointed out (*Thier-reich*, *Vögel*, p. 148) that Birds possessing it can spread and stretch their toes freely while the leg is also extended because then only it is not interfered with, and accordingly it is fully developed in running, wading, swimming and rapacious Birds, but absent in those which hop and climb.

Caudal and Iliac Head present.	Caudal Head alone present.	Iliac Head alone present.	Both Heads absent.
Ratitæ			
Tinamidæ			
Pedionomus	Turnix		
Gallinæ (most)		Pavo, Meleagris	
Pterocles			
Columbæ (most)		Lopholæmus	
Glareola			
Numenius	Scolopacinæ (most)		
Hæmatopus	Tringinæ		
Himantopus	Strepsilas		
Œdicnemus superciliaris, Œ. bistriatus		Œ. grallarius	
Charadrius		Otis	
Vanellus		Eupodotis	
Crex		Grus	
Parra		Dicholophus cristatus	D. burmeisteri
Sterninæ	Larinæ		
	Alcidæ		
Ibididæ	Ciconiinæ	Phœnicopterus	Leptoptilus
Platalea	Herodii		
Tubinares	Steganopodes		
Colymbus		Podicipes	
Spheniscidæ			
Anatidæ	Accipitres	Serpentarius	
	Striges		
	Psittaci		
Centropus	Pici		
	Cypselomorphæ		
	Passeres		

M. caud-ilio-flexorius or *semitendinosus*, subject to many modifications, but when fully developed, as in *Gallinæ*, arising from the transverse processes of the first three caudal vertebræ and the lateral margin of the posterior half of the post-acetabular ilium, and thence extending, as a broad ribbon, mesially from the ischiadic nerve towards the popliteal region, where it splits into two portions, one of which, being broad and fleshy, is inserted on the posterior face of the distal third of the femur, while the other starting at a right angle joins the fascia of the inner femoral head of the *m. gastrocnemius*. The divergence of these two portions is marked by a tendinous intersection, which running in the direction of the gastrocnemial insertion has caused the femoral portion of the whole to be wrongly described as the "accessory semitendinosus." The extent of the insertion on the femur varies much, occupying more than its distal half in *Rhea* or confined to the intercondyloid region. In almost all swimming Birds as well as in some of the *Picariæ*, there is a complete split between the femoral and crural portions, the crural tendon being then inserted on the neck of the tibia, and the original femoral portion forming part of the median femoral head of the *m. gastrocnemius*, in which case the "accessory head" is generally stated to be absent. The origin of this muscle likewise varies, arising either from the tail and ilium as in *Gallinæ*, *Pterocles*,



Left Thigh-Muscles (*Grus* or *Rallus*). Outer view after removal of the superficial m. iliofibularis and m. ilio-tibialis.

A, caudal, *B*, iliac portion of m. caud-ilio-femoralis; *X*, m. caud-ilio-flexorius; *Y*, accessory or femoral portion of the same; *Il. fb.* m. ilio-fibularis (cut away); *Il. tib.* m. ilio-tibialis (cut away); *Is. fl.* m. ischio-flexorius; *Is. fm.* m. ischio-femoralis; *P.i.f.* m. pub-ischio-femoralis; *Sart.* m. sartorius; *N*, nerve.

Numenius and *Rhamphastus*, or from the ilium only as in *Larus*, *Ardea*, *Grus*, *Corythaix* and *Podargus*. It is frequently connected aponeurotically with the *m. ischio-flexorius*, and when its "accessory" is absent, both are inserted on the tibia by one common tendon.

M. ischio-flexorius or *semimembranaceus*, ribbon-shaped, running parallel to the posterior margin of the preceding, present in all Birds, though sometimes much reduced, as in *Podicipes*, *Columbæ* and *Pterocles*, arising chiefly from the outer face of the middle or distal third of the ischium and inserted by a flat tendon on the neck of the tibia, whether on its anterior crest or the posterior or inner face. A slip from the principal tendon frequently descends the leg and is inserted either separately or jointly with a similar tendon of the *m. caud-ilio-flexorius*, being often connected with it in various ways.

M. ilio-fibularis or *biceps cruris*, arising from a great portion of the lateral and dorsal margin of the post-acetabular ilium, changing near the knee to a round and strong tendon that, accompanied by one of the principal stems of the ischiadic nerve, runs over a tendinous pulley[1] and passing between the outer and middle head of the *m. gastrocnemius* is inserted on the tuberosity of the fibula at about the level of the first fifth of the tibia.

M. extensor digitorum communis, arising from the outer and anterior face of the crest and proximal half of the tibia, its roundish tendon passes mesially from that of the *m. tibialis anticus* through the transverse ligament along the anterior metatarsal groove and, arrived at its distal end, splits into several tendons, according to the number of front toes, to be inserted on the dorsal surface of the base of their several phalanges. In *Striges* and *Pandion*, where the fourth toe is reversible, the principal tendon first splits into two, one for the second toe, the other soon subdividing for the third and fourth. In the *Rhamphastidæ* and *Cuculidæ*, the main stem goes to the third toe, and sends a short slip to each of the others. In the *Picidæ* the tendon for the fourth toe passes through an ossified loop and over a furrow at the end of the fourth metatarsal, so as to ensure the extension of this digit with the others notwithstanding its backward position. In the *Psittaci* alone the principal tendon sends a slip to the hallux also, the rest being divided into an inner and outer half, each of which splits again to be inserted on the other toes, the third of which therefore receives two such tendons.

M. extensor hallucis, arising from the anterior and inner face of the proximal part of the second tarso-metatarsal and inserted on the dorsal face of the base of the first phalanx of the hallux. Generally best developed in Birds with a large hallux, as *Apteryx*, *Gallinæ*, *Accipitres*, *Steganopodes* and *Herodii*, but yet very small in *Picus* and absent in *Psittaci*. When the hallux is very small, as in *Pterocles* and many *Limicolæ*, this muscle still exists, and though slender is rather long.

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[1] This pulley or loop on the outer side of the knee is composed of three arms, two arising from the outer face of the external femoral condyle, the third from the inner head of the *m. perforat. dig. iv.* and supporting the outer of two principal branches. Owing to the pulley the contraction of this muscle does not merely draw the leg towards the trunk, but also lifts it towards the thigh.

Mm. flexores longi digitorum consist of three principal sets, each of which is again divided into several muscles, the hallux having one, the fourth toe two, and the third and second toe three each, which are conveniently distinguished by the relation to one another of their respective tendons. Those that are inserted on the base of the first phalanges are perforated immediately above the insertion by the tendons of those that are inserted on the second and third phalanges, which in their turn are perforated by those that are attached to the terminal phalanges—hence there are *perforati*, *perforantes et perforati*, and *perforantes*.

Mm. flexores perforati digitorum ii. iii. iv. These three, of which each anterior toe has one, arise in a variable way, either separately or partly blended, from almost any part of the region of the knee, but especially from the posterior intercondylar space of the femur, from its outer condyle, from the ligaments of the knee and patella, the proximal part of the tibia and fibula, and lastly from the tendon of the *m. ambiens* (page 11), of which in most cases the *m. perforatus iii.* partly forms the continuation. Each of them becomes a distinct tendon which passes posteriorly over the intertarsal joint, and piercing the pad above mentioned, runs along the plantar groove of the metatarse to be inserted ventri-laterally on the base of the first phalanx of the second, third or fourth toe as the case may be—their insertion being perforated as before stated. The tendon of the *m. perforatus iii.* may be easily recognized, first by its passing the intertarsal joint and the pad the most superficially, and next by its receiving below that joint the lateral distal tendon of the *m. peroneus superficialis*. The tendon of *m. perforatus ii.* often passes the pad through a special canal, but in *Struthio* is wholly absent, in conformity with the loss of the corresponding toe. The tendon of *m. perforatus iv.* passes the intertarsal joint as superficially as that of the third toe, and is often inserted on all the four proximal phalanges of the fourth toe.

Mm. flexores perforantes et perforati digitorum ii. et iii., with a similar origin to the last group, except as regards the *m. ambiens* (page 11). The tendon of the second toe pierces the pad by a special canal, and is inserted on the plantar and lateral faces of the base of its first or second phalanx, after having perforated that of the foregoing and being perforated by that of the following muscle. It is absent in *Struthio*. The tendon of the third toe in many Birds receives a *vinculum* or slip from that of the *m. perforatus iii.*, then passes the pad and is inserted like that of the second toe on the base of its own second and third phalanges.

In conformity with the separate position of the hallux, the mass of deep flexors is divided into two principal portions, each becoming a strong tendon which passes through or posteriorly over the metatarsal pad and tubercle, then along the metatarsal groove for insertion in various ways on the plantar face of the last or two last phalanges, having in its course perforated the more superficial tendons. It is convenient to distinguish these two portions, the one as *m. flexor perforans,* the other as *m. hallucis longus.*

M. flexor perforans s. profundus, arising from the greater part of the hind face of the fibula and tibia, and rarely also from the outer femoral condyle, runs covered by all the other flexors straight to the intertarsal joint, which it passes more deeply than any of the rest, entering between the pad and the tibio-tarsus, piercing the former and immediately after the metatarsal tubercle as well. In most Birds its tendon divides just above the distal end of the metatarse, sending a slip to each front toe.

M. flexor hallucis longus, regarded as the posterior portion of the whole mass mentioned above, arises mostly from the intercondylar space, with its belly resting upon that of the preceding, but slightly towards the outer or fibular side, and its tendon in most cases accompanying that of the preceding, there to pass either through the tarsal pad and hypotarsus, resting in this case on the posterior surface of the other tendon, or lying a little towards its outer side, superficially over the pad and tubercle, after which both run down the metatarsal groove, that of the present resting on the plantar and fibular side of the other. About half-way down the middle of the metatarse the tendon of the *m. flex. hallucis* splits into two parts, one, continued as the so-called *vinculum* to the front tendon, the other, which is generally the weaker, to be inserted on the last phalanx of the hallux. It is obvious that the tendon of the *m. flex. hallucis,* after passing over the outer part of the ankle, must cross the deeper tendon obliquely to reach the hallux, a crossing which is correlated with its reversed position, and is really double, because the *m. flex. hallucis* arising more inwardly than the *m. flex. perforans,* and thus crossing it laterally, crosses it once above the joint and then again upon the metatarse, since its tendon goes to the hallux. It is also clear that, owing to the *vinculum,* contraction of the *m. flex. hallucis* bends not only the hallux but the other toes as well, while the *m. flex. perforans* acts on the front toes only. This *m. flex. hallucis* is therefore, properly speaking, a *m. flexor communis,* and the so-called *m. flex. perforans* is the anterior portion of the whole mass of deep flexors, a view which is justified by the fact that the *m. flex. hallucis* is present regardless of the absence of the hallux.

According to the variable configuration of the toes, whether two, three or four in number, whether the Bird be anisodactyl, syndactyl, zygodactyl, heterodactyl, eleutherodactyl or what, the connexion between the two principal deep flexors and their distribution to the toes exhibits many modifications, almost any combination conceivable occurring in some Bird or other. There can be no doubt that the various uses of the toes—running, climbing, grasping, rowing and so on, are the chief determining causes of the manifold arrangements of these tendons. It is easy to understand the action of a single muscle by itself, but of the action of a group of muscles, of their mutual play, and how they partially counteract, supplant or support one another, we know next to nothing. One point, however, is certain, and that is that coincidence does not necessarily indicate affinity. The misconception concerning these plantar tendons has exaggerated their taxonomic value, culminating in the separation of the *Trochilidæ* from the other *Cypselomorphæ*, and in the association of the *Cathartidæ* with the *Alcedinidæ*, *Coraciidæ*, *Caprimulgidæ* and *Bucerotidæ* to the exclusion of *Upupa*.

Sundevall[1] and Garrod[2] have done most to describe the modifications of the deep plantar tendons, which are reducible to *seven* chief types, most of them connected by intermediate stages.[3] In the following enumeration, the muscle and tendon of the *flexor perforans* are called A (anterior portion), those of the *flexor hallucis* P (posterior portion).

I. Vinculum from P to A. Tendon A splits into 3, going to toes ii. iii. and iv. Tendon P goes to i., and by the vinculum acts also on ii. iii. and iv.—*i.e.* upon all the toes.—The arrangement most commonly found in 4-toed birds, no matter whether the toes be normally placed, paired or reversible: *Ardeæ*, *Ciconiæ*, *Platalea*, *Gallinæ*, *Ralli*, *Grues*, *Rhinochetus*, *Eurypyga*, *Otis*, *Limicolæ*, *Pterocles*, *Columbæ*, *Laridæ*, *Alcidæ*, *Opisthocomus*, *Cuculidæ*, *Musophagidæ*, *Psittaci*, *Striges*, *Eurylæmidæ*. In *Herodii* the vinculum is either very weak or wholly lost, thus leading to type VII.

II. Vinculum very strong and broad, forming the direct and principal continuation of tendon P, of which the hallux receives but a slender portion. Tendon P goes to i. by vinculum to ii. iii. and iv.—*i.e.* it acts on all. Tendon A goes to ii. iii. and iv. Muscles A and P of equal strength. This is the case in *Apteryx*, *Tinamidæ* (*Nothura*), *Spheniscidæ*, *Steganopodes*, *Anseres*, *Colymbi*, *Podicipedes* and also in *Podica*.

III. Tendons A and P more or less fused throughout the greater extent of the metatarse. The vinculum and the level of the actual crossing are shifted to the distal portion of the metatarse. Tendon A goes to ii. iii. and iv. Tendon P to i. and by vinculum to ii. also, consequently, owing to the vinculum's distal position, its action is confined to two toes. This type, to a certain extent intermediate between I. and II., is characteristic of *Accipitres*, except *Cathartidæ* (see V.), and *Pandion*, in which last, perhaps owing to its reversible outer toe, A goes to ii. iii. and iv., but tendon P splits into 4, sending a slip to each toe directly, and in this case is therefore a complete *flexor communis.*

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[1] *Förhandl. Skandinav. Naturforsk.* 1851, pp. 259-269.

[2] *Proc. Zool. Soc.* 1875, pp. 339-348.

[3] *Thier-reich, Vögel*, p. 195.

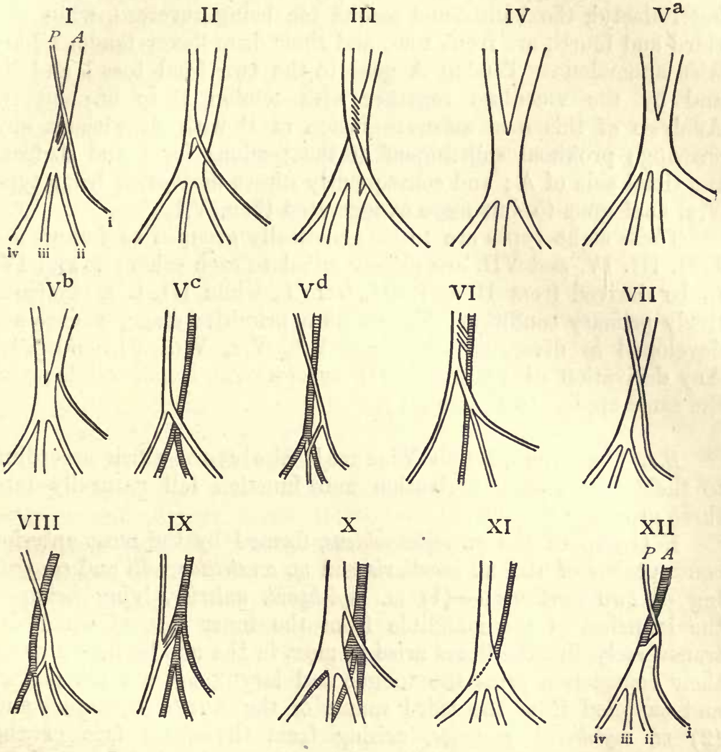
IV. The prevalent type where the hallux is absent or very small. Both muscles are strong and almost equally developed, their tendons unite about the middle of the metatarse, the joint tendon A + P going to the front toes, the hallux receiving no tendon, and consequently there is no crossing. This type, genetically connected with II., occurs in *Casuarius*, *Dromæus*, *Rhea*, *Struthio*, *Turnix*, *Pterocles* and *Phœnicopterus*, *Palamedea*, *Dicholophus*, *Tubinares*, *Colymbi.*

V. Tendons A and P unite at a variable distance below the ankle joint, passing it in the ordinary way, and there is no crossing behind the metatarse, tendon P running directly into A from its fibular side. Muscle A generally much stronger than muscle P. In the simplest case (V, a) the united tendons A + P split into 4 equally strong tendons, either just above the base of the toes, or successively first to the hallux and lastly to iv.—as in *Buceros*, *Cypselus* and *Colius.* Secondly an exaggerated condition of this (V,a) prevails (as V, b) in *Momotidæ*, *Todidæ*, *Meropidæ* and in some *Alcedinidæ*, where the tendon of the hallux is split off directly from the tibial and ventral side of A above its fusion with P. Thirdly there is a condition (V, c), hitherto known in the *Trochilidæ* only, where A and P are completely divided from each other into a deep mass (A) which goes to ii. and iii., and into a plantar mass supplying i. and iv. Careful and, from their small size, difficult preparations of this have been made by Prof. Stewart and Mr. Bourne for the Museum of the College of Surgeons in London, and any other description and figures of these Trochiline tendons are either incorrect or misleading. Lastly comes the modification found in the *Cathartidæ*, where the fusion of the two principal tendons (as in V, a and V, b) is followed by a splitting into a ventral mass (P) to ii. iii. and iv., and into a deep mass (A) to i. ii. and iii. This arrangement can be easily derived from type V, a, but almost equally well from the variable type III., as indicated by *Pandion* (fig. XI.) In the latter case the *Cathartidæ* would appear as a peculiar departure from primitive Accipitrine conditions.

VI. Vinculum present, going from P to A. Tendon A single, going only to iii. Tendon P going to i. ii. and iv., and by the vinculum to iii. also, *i.e.* to all the toes. This most peculiar type prevails in all the anomalogonatous zygodactyl Birds, *Picidæ*, *Rham-*

phastidæ, *Indicatoridæ*, *Bucconidæ*, *Capitonidæ* and *Galbulidæ*. The fourth toe being turned backwards behaves like a hallux and receives a tendon from the *flex. hallucis*, but this cannot be the only reason, since the *Cuculidæ* and *Psittaci* are also zygodactyl, but possess an ambiens, and belong to type I.

VII. Tendons A and P are entirely disconnected, owing to the loss of the vinculum. Tendon A goes to ii. iii. and iv.; Tendon P only to the hallux, which is always well developed and the only posterior toe. This type is the most differentiated and also the simplest. Morphologically therefore it is the highest. It exists in all the *Passeres*, except *Eurylæmidæ*, and in some *Herodii*.



DIAGRAMS SHEWING ARRANGEMENT OF TENDONS OF THE FOOT.

A, Tendon of the anterior portion (m. flexor perforans). *P*, Tendon of the posterior portion (m. flexor hallucis. The toes are numbered i. ii. iii. iv.

I-VIII, The types numbered according to Garrod, Gadow and Fürbringer. I, Gallus; II, Apteryx; III, Falconidæ; IV, Rhea; V^a, Cypselus; V^b, Momotus; V^c, Trochilus; V^d, Upupa and Irrisor; VI, Picus; VII, Oscines; VIII, Harpactes duvauceli; IX, Dacelo gigas; X, Heliornis surinamensis; XI, Pandion; XII, Cuculi.

(V^c, VIII, IX, after preparations in Mus. R. Coll. Surg.; X, after Beddard.)

Hitherto it has always been stated that *Upupa* has free tendons (as in type VII.) and this has been used as an argument for placing it among the *Passeres*; but, as a matter of fact, in *Upupa* and *Irrisor*, tendon P sends a vinculum to the slips of tendon A which goes to iii., and this vinculum joins A below, not above, the root of the toes (see fig. V, d).

VIII. This type is peculiar to the *Trogonidæ.* These Birds are heterodactyl, the hallux and second toe being reversed, while the third and fourth are front toes, and their deep flexor tendons likewise anomalous. Tendon A goes to the two hind toes i. and ii., and by the vinculum together with tendon P to iii. and iv. Analysis of this case means:—fusion of P with A, without any crossing; proximal splitting-off of the tendons for i. and ii. from the tibial side of A; and consequently direct derivation from type V, a, analogous to, but more exaggerated than, V, b.

These eight types are to be genetically grouped as follows:—I. II. III. IV. and VII. are closely allied to each other; I. and IV. to be derived from II. and VII. from I., while III. is a comparatively primary condition; V, a shews a primitive stage, whence are developed in diverging directions V, b, V, c, V, d, VI. and VII. Any derivation of VI. from VIII. or *vice versâ* is impossible; and the same applies to V, c and VI.

B.a. Muscles of the Visceral Skeleton, which according to their innervation, derivation and function fall naturally into three groups.

1. Group of the *m. mylohyoideus*, formed by the most anterior continuation of the *m. cucullaris* and *m. constrictor colli* and consisting of two portions:—(1) *m. mylohyoid. anterior*, lying between the branches of the mandible from the inner face of which its transversely-directed fibres arise to meet in the middle line, and by their contraction press the tongue and larynx against the palate, and supplied from the third ramus of the *nervus trigeminus*, and (2) *m. mylohyoid. posterior*, arising from the outer face of the posterior end of the mandible and sometimes also from the adjoining part of the occiput, and inserted in the corner formed by the hyoid horn and the *corpus linguæ*, being supplied by a branch of the *nervus facialis*, and drawing the tongue with the larynx upward and backward. When the tongue is very protractile or very thick this portion consists of two parts, one, *m. serpi-hyoideus*, arising from the serpiform process of the mandible, the other, *m. stylohyoideus*, from the occiput.

2. Group of the masticatory muscles, supplied by *nervus trigeminus* and *n. facialis.*

M. digastricus or *depressor mandibulæ*, large and often compound, generally arising from the lateral occipital bone, and inserted on the inner angular process of the mandible, acting on the jaw behind the articulation so as to open the mouth.

M. temporalis, consisting of a variable number of parts, the chief of which, arising from the postorbital process and the quadrate, pass beneath the jugal arch and are inserted on the mandible in front of the joint, acting mostly as masseters. Two or three smaller muscles, arising from the deeper region of the orbit and the interorbital septum to be inserted on the palatal and pterygoid bones, are much less constant.

M. pterygoideus, arising chiefly from the ventral face of the pterygoid, palatal and, sometimes, from the maxillary bones, and inserted on the inner face of the mandibular articulation, close the bill or, when the mouth is open, flex the upper mandible, as seen in *Psittaci*, *Anatidæ* and others.

3. Group of the Hyoid muscles, supplied solely by *nervus hypoglossus* often very numerous and always attached to the HYOID apparatus (page 452), whence they reach backward to the sternum or to the furcula as *mm. sterno-hyoidei* or *mm. cleido-hyoidei*, to the larynx and trachea as *mm. thyreo-hyoidei* or *mm. tracheo-hyoidei*, while others extend forward to the mandible as *mm. genio-hyoidei* and *genio-glossus*, or lastly they connect the various portions of the Hyoid apparatus. In most cases their position is indicated by their name.

System of the *m. sterno-hyoideus*, a long pair of muscles, presenting its least differentiated condition in *Apteryx* (where no other sterno-hyoid or sterno-tracheal exists). The broader and more superficial portion arises from the ventral face of the thyroid cartilage and the hyoid bones, meeting its fellow without being attached to the trachea, and is inserted aponeurotically on the lateral and posterior margin of the sternum, partly covering the muscles of the shoulder and breast. The deeper portion likewise begins at the thyroid cartilage, passes down the side of the trachea, to which it is firmly attached until just above the bronchial fork, where it leaves it to be inserted near the coraco-sternal articulation. From the conditions just described are differentiated the more complex arrangements found in other Birds. By reduction of the muscular mass about the middle of the neck an upper and lower portion are formed, the upper then appearing as tracheo-laryngeal or thyrohyoid muscles—the lower as sterno- or cleido-tracheal, and through further extension to the bronchi as muscles of the SYRINX. In many Birds the superficial portion of the whole system remains as one or two ribbons, *m. cleido-hyoideus*, running along the side of the neck and connecting the tongue with the furcula, or other parts of the scapular arch. The chief retractor of the tongue, *M. tracheo-hyoideus* reaches its highest development in some of the *Picidæ*, where it takes several spiral turns round the trachea.

M. genio-hyoideus, arising from about the middle of the mandibular bar, extends as a ribbon to the hyoid bone, round which it twists loosely; and, being attached to its dorsal extremity, the contraction of the spiral surrounding the hyoid horns protrudes them with great force, the extent of protrusion depending on their length. This is greatest in *Trochilidæ* and *Picidæ*, in some of which they pass round the head and reach forward to the nostrils.

M. genio-glossus, a small protractor of the tongue, connecting the *os entoglossum* with the chin, but often absent.

M. ceratoglossus, arising from the dorsal face of the ceratohyal, inserted by a tendon laterally on the *os entoglossum*, which it draws sideways or bends when acting jointly with its fellow.

M. cerato-hyoideus, extending from the inner face of the ceratohyal to the urohyal, but often absent.

M. hypoglossus, extending from the ventral face of the body of the tongue to the ventral or lateral face of the *os entoglossum.*

MUSKET- or MUSQUET-HAWK (O. Fr. *mousquet* or *mouchet*), an old name for the cock Sparrow-HAWK, seemingly given from its comparatively small size (Fr. *mouche*, Lat. *musca*—a fly), and hence, on the invention of fire-arms, applied to one which was smaller and handier than the older match-lock.

MUTTON-BIRD, a sailors' name for at least one species of SHEARWATER, but especially for *Puffinus brevicauda*, presumably because "the young are literally one mass of fat, which has a tallowy appearance" (Gould, *Handb. B. Austral.* iii. p. 462). Mr. Robert Elwes has given (*Ibis*, 1859, pp. 397-399) a remarkable account of one of the most frequented breeding-places of this bird on an island in Bass's Strait, which, it is to be feared, no longer exists as such owing to the devastation wickedly carried on—nearly 60,000 *breeding* birds having been taken in a single season.

N

NANDU, from *Nhandu-guaçú*, given by Marcgrave and Piso as the Brazilian name of the RHEA, and occasionally used for that bird by some English writers.

NASAL GLANDS exist pairwise in almost all Birds, and their tear-like secretion serves to moisten and cleanse the mucous lining of the nasal cavities. Each gland has a duct opening into the vestibulum of the nares below the nasal bone, and passing beneath the lacrymal bone. These glands vary much in shape, size, position and colour, in the last respect ranging from bluish-red to red and pale yellow. They are very large in *Limicolæ*, except *Scolopax*, and are occasionally absent in *S. rusticola*, *Laridæ*, *Colymbidæ* and *Tubinares*, resting subcutaneously on the frontals between the eyes, or above the orbital margin and producing on these bones deep depressions, the configuration of which, together with lateral notches, or canals between the nasals, lacrymals and frontals can, with care, be used for taxonomic purposes. In most *Anseres* the glands are small and placed on the upper orbital margin. When they are small they extend to the orbital cavity only or are restricted to the maxillary cavity, as in *Ratitæ*, *Gallinæ*, *Columbæ*, *Otis*, *Sula*, *Pelargi*, *Accipitres*, *Picariæ* and *Passeres*.

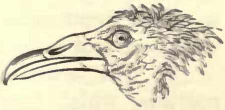
NASUTÆ, Nitzsch's name in 1840 for the group which Illiger had called TUBINARES in 1811.

NATATORES, Illiger's name in 1811 for an Order of Birds (including 6 Families and 22 genera), equivalent to the Linnæan ANSERES. Holding its place, to the exclusion of the older term, for about fifty years, ornithologists at last perceived that the group contained many forms which have no affinity, and the word is now hardly used but by writers who know little of the principle of Taxonomy.

NATIVE-COMPANION, *Grus australasianus* (CRANE); -HEN, any species of *Tribonyx* (RAIL); -PHEASANT, *Lipoa ocellata* (MEGAPODE); -SPARROW, *Zonæginthus oculeus*, one of the WEAVER-BIRDS; -THRUSH, *Pachycephala olivacea* (THICKHEAD); -TURKEY, *Otis australis*, a BUSTARD—all names used, according to Gould, by the English in Australia or Tasmania.

NECK, or *cervix*, that part of the body which extends from the head to the thorax, the last cervical vertebra being the one which carries a pair of ribs that do not join the STERNUM.

NEOPHRON, the generic term given to the *Vultur percnopterus* of Linnæus by Savigny[1] when separating it from the other VULTURES, and sometimes used as an English word.


NEOPHRON.
(After Swainson.)

NEOSSOPTILE, see FEATHERS (p. 243).

NERVOUS SYSTEM. This consists of two parts, (1) a *Central* portion, composed of the Spinal Cord and BRAIN, and (2) *Peripheral*, containing the Cranial and Spinal Nerves, together with all that pertains to what is called the *Sympathetic*.

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[1] He took the word from the pseudomythological *Metamorphoses* (or *Transformationum congeries*, Fab. 5) of Antoninus Liberalis, a writer who flourished about the middle of the second century, Neophron being the name of a man changed, for a base trick he played, into a Vulture by Zeus.

I. *The Spinal Cord* or "Marrow" is the continuation of the medulla oblongata, extending throughout the vertebral canal to the tail, being swollen at the level of the shoulders by an accumulation of ganglionic cells to serve the Brachial Nerve Plexus governing the fore-limbs, and again in the lumbar region where the nerves of the hind-limbs have their origin. On the dorsal side of this lumbar swelling, there is a lozenge-shaped slit, the sacro-rhomboidal sinus, filled with a colourless gelatinous substance, behind which the cord lessens gradually, ending as a thin thread in the last free caudal vertebræ. The whole of this System is encased in a strong, fibrous sheath of connective tissue, the *dura mater*, the outer layer of which is closely attached to and forms the lining of the central vertebral canal, while its inner layer forms a looser and more meshy tissue. A much thinner membrane, the *pia mater*, is immediately attached to the surface of this System, penetrating its various furrows or sulci, and containing blood-vessels which nourish the nervous matter. Between the *dura* and the *pia mater*, but partly separated from each by lymphatic spaces, lies the Arachnoid Membrane.

The composition of the Spinal Cord is best studied in transverse section:—in the midst is the central canal, on the medio-ventral and medio-dorsal lines are the anterior and posterior sulci, forming more or less deep vertical slits which thus divide the cord into a right and left side. The central portion of the cord, distinctly grey in colour, being composed of grey nerve-fibres, without axial cylinders, and interspersed with numerous ganglionic nerve-cells, arranged in the form of a saltire or St. Andrew's cross, of which the ventral pair of limbs contain the ganglia and send out the *motory* roots of the spinal nerves, while the dorsal pair contain the ganglia and send out the *sensory* bundles of nerve-fibres. This grey matter is surrounded by a thick mantle of white nerve-fibres, most of them conducting threads composed of an axial cylinder with a sheath, and running longitudinally parallel to each other, though at the so-called commissures a crossing from one side to the other occurs with many of both white and grey fibres.

II. *The Spinal Nerves* arise from the medulla by a number of rootlets, which leave its surface in the form of a dorsal and a ventral root—the former (with a small swelling, the spinal ganglion, at its base) containing the sensory, the latter the motory fibres; but all the fibres of each issue as a single bundle either between two vertebræ or pass through a hole at the anterior end of a vertebra. The first spinal or cervical nerve issues between the occiput and the atlas, and each that follows from the anterior end of its vertebra—all on leaving the vertebral column separating into three branches—a dorsal, ventral and visceral. The first two contain sensory and motory nerves mixed; but the dorsal branches are small and innervate the skin and muscles of the dorsal spinal tract, while the ventral branches are much larger, and, depending on the muscles they have to supply, are strongest in the region of the limbs. The visceral branches, or "sympathetic nerves," supply chiefly the digestive, vascular and generative organs.

Four or five of the lowest cervical nerves join to form the *Brachial Plexus,* whence diverge those that serve the wings and shoulders; but the composition of this *plexus* varies considerably not only in different species but even individually. The serial number of the nerves entering into its formation depends chiefly on the length of the neck, the extremes being found in *Cypselus* (10th to the 14th cervical pair), and *Cygnus* (22nd to 24th), intermediate cases occurring in *Columba* (11th to 15th), *Gallus* (13th to 17th), *Anas* (15th to 18th) and in many *Passeres* (12th to 15th). The last nerve of this plexus often marks off the boundary of the cervical and thoracic regions, by issuing just above the first thoracic vertebra.

The nerves arising from this plexus are divided into (A) small dorsal branches supplying the scapular muscles, and (B) thoracic branches forming a system for the sterno-coracoid and all the wing-muscles. The thoracic branches (B) send off a group (*a*) to the superior and another (*b*) to the inferior brachial muscles. Among the former (*a*), the chief are (1) *nervus subcoraco-scapularis* for the m. subcoracoideus, m. subscapularis and m. subcoraco-scapularis, (2) *n. musculi latissimi dorsi,* (3) *n. axillaris,* a strong nerve passing the humero-scapular joint, running between the humerus and the m. triceps, and innervating the deltoid muscles, as well as the skin of the shoulder, upper arm and propatagium, and (4) the *n. radialis,* the strongest nerve of all, running spirally round the dorsal side of the humerus, supplying the m. triceps, and, dividing at the elbow into a superficial and a deep branch, innervating all the numerous exterior muscles beside the skin and feathers of the forehead. Among the latter group (*b*) are three strong nerves (1) the *n. supracoracoideus,* covered by a membranaceous ligament, crossing the coracoid and supplying the m. supracoracoideus,[1] (2) the *n. pectoralis* for the large pectoral muscle, and (3) the *n. brachialis inferior,* which accompanies the last so far as the axilla, and then passing along the humerus divides into a *n. medianus,* supplying the m. biceps and the radial side of the forearm and hand, and a *n. ulnaris,* sending several branches to the ulnar side.

The spinal nerves succeeding to the Brachial Plexus are those of the intercostal region, their short dorsal branches supply the

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[1] In many birds the median side of the coracoid has a notch (bridged by a tendinous ligament) for the passage of the nerve, which in other cases may pass through a foramen near the inner side of that bone; but these differences have little taxonomic importance.

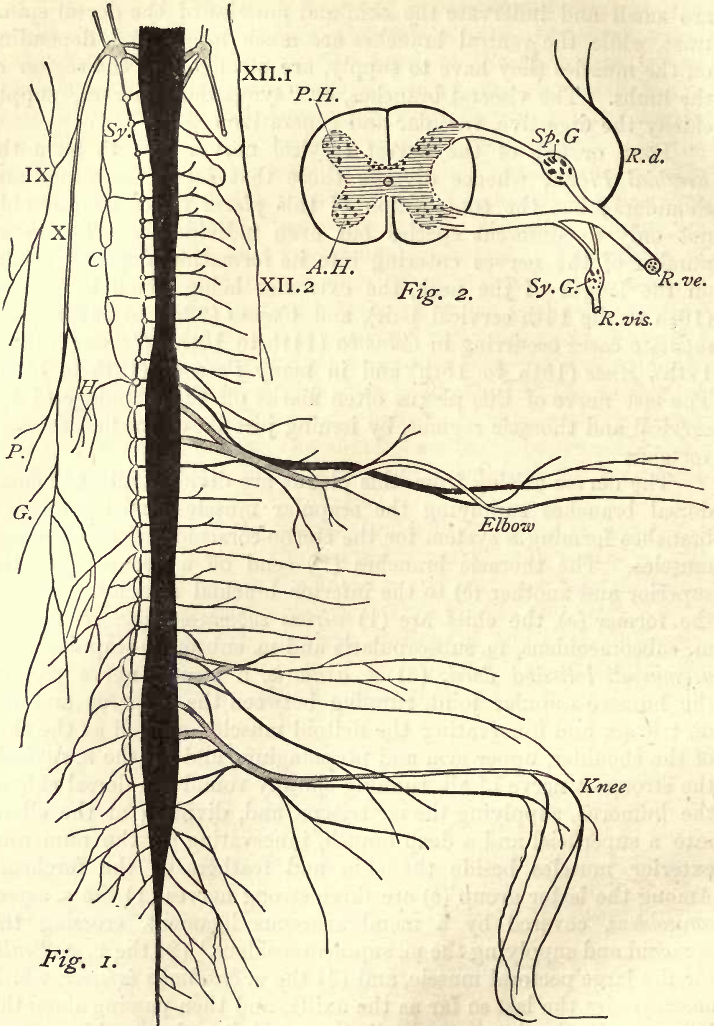


Fig. 2.

Fig. 1.

Fig. 1.—Diagrammatic Representation of the peripheral Nervous System of a Bird. Ventral view. Left side showing the Somatic, right side showing the Visceral Nerves.

IX. N. glossopharyngeus; X. N. vagus, *C. G. H. P.* its distribution to the Carotid, the Heart, Lungs, Stomach and Gut; XII.1, Lingual branch and XII.2, Syringeal branch of N. hypoglossus; *Sy.* Sympathetic ganglion of the first spinal nerve.

Fig. 2.—Diagrammatic view of a transverse section through the spinal cord on the level of the exit of a typical spinal nerve.

A.H. and *P.H.* Anterior or ventral and Posterior or dorsal Horns with ganglia, of the grey substance; in the middle of which is seen the central canal; *Sp.G.* the Spinal Ganglion of the dorsal root of the spinal nerve; *Sy.G.* the Sympathetic Ganglion; *R.d.*, *R.ve.*, *R.vis.* Dorsal, Ventral and Visceral (or sympathetic) branches of the spinal nerve.

dorsal muscles of the spine, and their long ventral branches run between the ribs, supplying the intercostal and, further back, the abdominal muscles.

The *Sacral Plexus* is formed by the Spinal Nerves in the pelvic region, and may be conveniently divided into (A) a Crural or Lumbar, (B) a Sciatic, and (C) a Pudic portion. The first (A) is composed of from 2 to 4, but generally of 3 nerves, the foremost of which sends a long branch to the abdominal muscles, while the hindmost, *n. furcalis,* leaving the spinal column, as a rule, between the 2 last lumbo-sacral vertebræ, divides—one-half going to the Sciatic portion. From the Crural portion spring several branches forming 3 groups—(1) those that serve the m. sartorius, m. ambiens and some other muscles of the leg; (2) the *n. obturatorius,* supplying the m. obturator and its accessories, as well as the m. adductor magnus; and (3) a long nerve which runs down the median side of the thigh to the inner side of the knee, supplying the latter and passing subcutaneously down the median side of the leg. This nerve is almost peculiar to Birds, occurring beside only in Crocodiles and Monotremes.

The Sciatic portion (B) generally consists of 5 or 6 nerves, which leave the pelvis as a thick stem, passing close behind the antitrochanter through the ischio-iliac foramen, where a strong branch separates itself from the hinder side of the common stem to supply most of the adductor muscles of the thigh and leg. From the main stem branches are given off to the ilio-femoral, ilio-tibial, ilio-fibular and ischio-femoral muscles. The rest of the stem continues as the Sciatic nerve, accompanied by the great arteries and veins on the posterior side of the thigh, and below the knee invariably divides into 3 branches, the first of which (1) is the strongest, and passes with the tendon of the ilio-fibular muscle through the peculiar tendinous pulley on the side of the fibula, whereupon it splits into the superficial and deep peroneal nerves, to supply the extensor and peroneal muscles of the foot and toes; the median branch (2) soon breaks up into a number of nerves for the deep flexor muscles of the toes and the inner and middle portion of the m. gastrocnemius; while the third (3) innervates the outer head of the gastrocnemius and the rest of the flexor muscles of the toes. As before stated, the Sciatic portion (B) receives one-half of the *n. furcalis* from the Crural (A), while its hindmost spinal stem, leaving the spinal column, in most birds, between or just below the hindmost of the 2 primary sacral vertebræ (see *Pelvis* under SKELETON), sends a branch to the Pudic portion (C), which is composed of the post-ischiadic spinal nerves. These are partly imbedded in the substance of the KIDNEYS, and run obliquely outwards, forming many anastomoses with one another, especially on the hinder parts of the ischium and pubic bone. This portion chiefly innervates the ventral muscles between the pelvis and tail, together with those of the cloacal region and the copulatory organs.

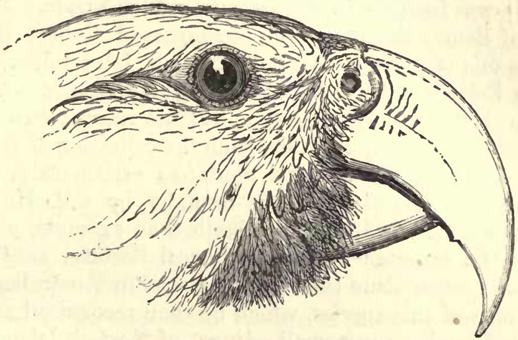
The dorsal branches of all the spinal nerves in the whole pelvic region are restricted to small, cutaneous branches in conformity with the reduction of the dorso-spinal muscles. The caudal nerves are also small, their dorsal branches supply the levator and their ventral the depressor muscle of the tail.

III. The *Cranial* or *Cerebral Nerves* have been already described (BRAIN).

IV. The *Sympathetic System* consists of the visceral branches of the Cerebro-Spinal Nerves, and supplies chiefly the alimentary and genital organs and the circulation. The Nerves composing it have no axial cylinder: they are paler than the white fibres, and are characterized by the presence of ganglia in their course, each branch containing one near its base which beside sending off other ramifications is connected with the corresponding ganglion of the next metamere, so as to form a "Sympathetic" chain running along each side of the ventral surface of the vertebral column. The two chains by means of these connexions somewhat resemble a ladder, the cross-bars of which are called *rami communicantes*, from a mistaken notion that they join the longitudinal "strand" or *n. sympathicus* of their side with the medulla, the fact being that the cross-bars are the true "rests," the lateral strands rather making the connexion between the successive ganglia. In the region of the NECK each of these strands runs, accompanied by the vertebral artery of its side, through the transverse foramen of each of the cervical vertebræ. In the thoracic region each strand is double, and the basal ganglia are successively connected with the next by a nervous branch which runs over the head of the rib, and by another which passes directly through the space between the head of the rib and its tubercle. In the pelvic region each strand again becomes single; but, conversely to the single strand of the cervical region, each is composed of ventral branches only, while lastly in the caudal region the right and left branches approach and coalesce in the middle line. From the first thoracic ganglion there issues a cardiac branch supplying the HEART, while other branches starting from neighbouring ganglia form a sort of plexus which, accompanying the cœliac artery, innervate the stomach, LIVER and other viscera. Similar branches from the basal ganglia of the lumbar and sacral regions form a plexus with ganglia numerously interspersed, and serve the rest of the Alimentary Canal, the KIDNEYS (page 480), genital organs and CLOACA (page 90), where they partly anastomose with the branches of the Pudic portion of the Sacral Plexus.

From the first pair of cervical ganglia the Sympathetic strands are continued on either side to the ganglia of the *n. hypoglossus*, and thence to the *ganglion supremum* of the combined *n. vagus* and *glossopharyngeus.* From this last, which sends out long sympathetic branches to the carotids and the throat generally, the Sympathetic chain extends to the head by complicated connexions with the ganglia of the 7th, 5th and 3rd pairs of cranial nerves (see BRAIN), its numerous branches serving chiefly the blood-vessels of the head, the lacrymal glands and the EYES.

NESTOR, the name applied to a small but remarkable group of Parrots peculiar to the New-Zealand Region, of which the type is the *Psittacus meridionalis* of Gmelin, founded on a species described by Latham (*Gen. Synops.* i. p. 264), and subsequently termed by him *P. nestor*, in allusion to its hoary head, but now usually known as *Nestor meridionalis*, the "*Kaka*" of the Maories and English settlers in New Zealand, in some parts of which it was, and even yet may be, very abundant, though its numbers are fast decreasing. Forster, who accompanied Cook in his second voyage, described it in his MS. in 1773, naming it *P. hypopolius*, and found it in both the principal islands. The general colour of the Kaka is olive-brown, nearly all the feathers being tipped with a darker shade, so as to give a scaly appearance to the body. The crown is light grey, the ear-coverts and nape purplish-bronze, and the rump and abdomen of a more or less deep crimson-red; but much variation is presented in the extent and tinge of the last colour, which often becomes orange and sometimes bright yellow. The Kaka is about the size of a Crow; but a larger species, generally resembling it, though having its plumage varied with blue and green, the *Nestor notabilis* of Gould, was discovered in 1856 by Mr. Walter Mantell, in the higher mountain-ranges of the South Island. This is the "*Kea*" of the Maories, and has of late incurred the enmity of colonists by developing, when pressed by hunger in winter, an extraordinary habit of assaulting sheep, picking holes with its powerful beak in



HEAD OF NESTOR. (From Buller.)

their side, wounding the intestines, and so causing the animals' death. The lacerations are said to be made so uniformly in one place as to suggest deliberate design; but the bird's intent has yet to be investigated, though it is admittedly an eater of carrion in addition to its ordinary food, which, like that of the Kaka, consists of fruits, seeds, and the grubs of wood-destroying insects, the last being obtained by stripping the bark from trees infested by them. The amount of injury the Kea inflicts on flock-masters has doubtless, as always happens in similar cases, been much exaggerated, for Dr. Menzies states (*Trans. N. Zeal. Inst.* xi. p. 377) that on one "run," where the loss was unusually large, the proportion of sheep attacked was about one in three hundred, and that those pasturing below the elevation of 2000 feet are seldom disturbed.[1]

On the discovery of Norfolk Island (10th October 1774) a Parrot, thought by Forster to be specifically identical with the "Kagháá" (as he wrote the name) of New Zealand,—though his son (*Voyage*, ii. p. 446) remarked that it was "infinitely brighter coloured,"—was found in its hitherto untrodden woods. Among the drawings of Bauer, the artist who accompanied Robert Brown and Flinders, is one of a *Nestor* marked "Norfolk Isl. 19 Jan. 1805," on which Von Pelzeln in 1860 founded his *N. norfolcensis*. Meanwhile Latham, in 1822, had described, as distinct species, two specimens evidently of the genus *Nestor*, one, from the collection of Mr. Thomas Wilson of Maidenhead, said, but doubtless erroneously, to inhabit New South Wales, and the other brought by Col. Hunter from Norfolk Island. In 1836 Gould described an example, without any locality, in the museum of the Zoological Society, as *Plyctolophus productus*, and when some time after he was in Australia, he found that the home of this species, which he then recognized as a *Nestor*, was Phillip Island, a very small adjunct of Norfolk Island, and not more than five miles distant from it. Whether the birds of the two islands were specifically distinct or not we shall perhaps never know, since they are all extinct (EXTERMINATION, pp. 223, 224), and no specimen undoubtedly from Norfolk Island seems to have been preserved;[2] while, now that we are aware of the great diversity in colour, size, and particularly in the form of the beak, to which the New-Zealand members of the genus are subject, it would be unsafe to regard as specific the differences pointed out by Von Pelzeln from Bauer's drawing. The Phillip-Island *Nestor* may be distinguished from both of the New-Zealand species by its somewhat smaller size, orange throat, straw-coloured breast, and the generally lighter shade of its tints.

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[1] A third form, from an unknown locality, has been distinguished as *N. esslingi* (*Rev. Zool.* 1856, p. 223), and has been regarded by several writers, and among them Count T. Salvadori (*Cat. B. Brit. Mus.* xx. p. 8), as a good species, though Sir W. Buller (*B. N. Zeal.* ed. 2, i. pp. 150-175) believes it to be, like his own *N. occidentalis* and *N. superbus*, as well as the so-called *N. montanus* of Haast, founded on individual variation.

[2] Canon Tristram (*Ibis*, 1892, p. 557) believes that one in his possession had this origin, and so it may prove.

The position of the genus *Nestor* in the Order *Psittaci* must be regarded as uncertain. Garrod removed it altogether from the neighbourhood of the Lories (*Proc. Zool. Society*, 1874, p. 597), to which indeed the structure of its tongue, as previously shewn by him (*op. cit.* 1872, p. 789), indicates only a superficial resemblance. Like so many other New-Zealand forms, *Nestor* seems to be isolated, and may fairly be deemed to represent a separate Family—*Nestoridæ* —a view adopted by Count T. Salvadori (*Cat. B. Brit. Mus.* xx. Introd. p. viii.), and fully justified by a cursory examination of its osteology, though this has hitherto been only imperfectly described and figured (Eyton, *Osteol. Avium*, p. 72; A. B. Meyer, *Abbild. von Vogel-Skeletten*, p. 18, pl. 23).

Further knowledge of this very interesting form may be facilitated by the following references to the *Transactions and Proceedings of the New Zealand Institute*, ii. pp. 64, 65, 387; iii. pp. 45-52, 81-90; v. p. 207; vi. pp. 114, 128; ix. p. 340; x. p. 192; xi. p. 377; and of course to Sir Walter Buller's *Birds of New Zealand*, especially the second edition.

NESTS, see NIDIFICATION.

NIAS (Fr. *Niais*, and that from the Low Latin *Nidax*, a nestling), corruptly "Eyas" or "Eyess," a falconer's term for a Hawk that has been brought up from the nest, in contradistinction to a "Haggard" or Hawk that has been caught wild.

NIDICOLÆ, a word used in this work in no systematic sense, but as a convenient term to indicate those Birds, the young of which remain in the nest for a shorter or longer time as opposed to NIDIFUGÆ, or those whose chicks are hatched in a condition enabling them to leave their birthplace at once. The *Nidicolæ*, all of which have their eyes closed at coming into the world, may be divided into four categories, according to their initial state and the way in which they subsequently develop:—

(1) Those born with a clothing of "Neossoptiles" (see FEATHERS, p. 243), as *Accipitres*, *Alcidæ* (partly), *Caprimulgi*, *Columbidæ*, *Eurypyga*, *Heliornis* (excl. *Podica*), *Sphenisci*, *Striges*, *Tubinares*.

(2) Those born naked or nearly so, but soon acquiring a thick clothing of neossoptiles, often of complicated structure, as *Ardeæ* (+ *Scopus*), *Cathartæ*, *Ciconiæ* (+ *Platalea*), *Podica*, *Steganopodes*.

(3) Those born naked, but with a few neossoptiles growing out of the tip of the "Teleoptiles" (see FEATHERS, p. 243) as *Passeres*, *Upupidæ*.

(4) Those born naked and never acquiring neossoptiles, nearly

all being birds that breed in holes, as *Alcedines*, *Bucerotidæ*, *Coraciidæ*, *Cuculidæ*, *Cypseli*, *Meropidæ*, *Momotidæ*, *Musophagidæ*, *Pici*, *Todidæ*, *Trochilidæ*.

The *Bucconidæ*, *Coliidæ*, *Eurylæmidæ*, *Galbulidæ* and *Trogonidæ* are probably all naked.

Menura is said to have downy nestlings.

Opisthocomus is born with open eyes, but is fed by its parents, and has an imperfect nestling plumage.

The interesting correlation between Neossoptiles and permanent Downs (see FEATHERS, p. 242) is shewn (*Thier-reich*, *Vögel*, Systemat. Theil, pp. 76-85).

NIDIFICATION, or the building of the nest in which the EGGS are to be incubated and hatched, is with most Birds the beginning of the real work of the breeding-season, to which SONG and its concomitant actions are but the prelude or the accompaniment; but with many it is a labour that is scamped if not shirked. Some of the AUK tribe place their single egg on a bare ledge of rock, where its peculiar conical shape is but a precarious safeguard when rocked by the wind or stirred by the thronging crowd of its parents' fellows. The Stone-CURLEW and the NIGHTJAR deposit their eggs without the slightest preparation of the soil on which they rest; yet this is not done at haphazard, for no birds can be more constant in selecting, almost to an inch, the very same spot which year after year they choose for their procreant cradle.[1] In marked contrast to such artless care stand the wonderful structures which others build for the comfort or safety of their young. But every variety of disposition may be found in the Class. The Apteryx (KIWI) seems to entrust its abnormally big egg to an excavation among the roots of a tree-fern; while a band of female OSTRICHES scrape holes in the desert-sand, and therein promiscuously dropping their eggs cover them with earth, and leave the task of incubation to the male, who discharges the duty thus imposed upon him by night only, and trusts by day to the sun's rays for keeping up the needful, fostering warmth. Some MEGAPODES bury their eggs in sand, leaving them, as many Reptiles do, to come to maturity by the mere warmth of the ground, while others raise a huge hotbed of dead leaves wherein they deposit theirs; but in either case the young are hatched without further care on the part of either parent. The GREBES and some RAILS seem to avail themselves in a less degree of the heat generated by vegetable decay (*B. Norf.* iii. p. 240),[2] and dragging from the bottom or sides of the waters they frequent fragments of aquatic plants form of them a rude half-floating mass which is piled on some growing water-weed—but these birds do not spurn the duties of maternity. Many of the GULLS, SANDPIPERS, and PLOVERS lay their eggs in a shallow pit which they hollow out in the soil, and then as incubation proceeds add thereto a low breastwork of haulm. The Ringed Plover commonly places its eggs on shingle, which they so much resemble in colour; but when breeding on grassy uplands it paves the nest-hollow with small stones. PIGEONS mostly make an artless platform of sticks so loosely laid together that their pearly treasures may be perceived from beneath by the inquisitive observer. The PIE, as though conscious that its own thieving habits may be imitated by its neighbours, surrounds its nest with a hedge of thorns. Very many birds of very different groups bore holes in some sandy cliff, and at the end of their tunnel deposit their eggs with or without bedding. Such bedding, too, is very various in character; thus, while the SHELD-DRAKE and the Sand-MARTIN supply the softest of materials,—the one of down from her own body, the other of feathers collected by dint of diligent search,—the KINGFISHER forms in the course of incubation a couch of the undigested spiny fish-bones which she ejects in pellets from her own stomach. Other birds, as the WOODPECKERS, hew holes in living trees, even when the timber is of considerable hardness, and therein establish their nursery. Some of the SWIFTS secrete from their salivary glands a fluid which rapidly hardens as it dries on exposure to the air into a substance resembling isinglass, and thus furnish the "edible birds' nests" that are the delight of Chinese epicures. In the architecture of nearly all the PASSERES, too, some salivary secretion seems to play an important part. By its aid they are enabled to moisten and bend the otherwise refractory twigs and straws and glue them to their place. Spiders' webs also are employed with great advantage for the purpose last mentioned, but perhaps chiefly to attach fragments of moss and lichen so as to render the whole structure less obvious to the eye of the spoiler. The TAILOR-BIRD deliberately spins a thread, and therewith sews together the edges of a pair of leaves to make a receptacle for its nest; while the Fantail WARBLER, by a similar process of stitching—even making a knot at the end of the thread—unites as a sheltering canopy above its nest the upper ends of the grass stems amid which it is built. Beautiful too is the felt fabricated of fur or hairs by the various species of TITMOUSE, while many birds ingeniously weave into a compact mass both animal and vegetable fibres, forming an admirable non-conducting medium which guards the eggs from the extremes of temperature outside. Such a structure may be open and cup-shaped, supported from below as that of the CHAFFINCH and

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[1] I make this statement literally on the experience of my brother Edward and myself, but I believe it will be abundantly confirmed by the evidence of other observers.

[2] Mr. Southwell found the temperature of an unincubated nest of *Podicipes cristatus* to be 67°, that of two incubated nests to be 72° and 73° respectively,

and that of a nest of *Fulica atra* to be 61°, while the maximum temperature of the air that day was 58° Fahr.

GOLDFINCH, domed like that of the WREN and Bottle-Titmouse, slung hammock-wise as in the case of the Golden-crested Wren and the ORIOLES, or suspended by a single cord as with certain GROSBEAKS and HUMMING-BIRDS. Under such circumstances it is even sometimes needful to balance the nest lest the weight of the growing young should destroy the equipoise, and, precipitating them on the ground, dash the hopes of the parents, and compensation in such cases is applied by loading the opposite side of the structure with lumps of earth. Certain WARBLERS (*Aedon* and *Thamnobia*) for some unascertained reason invariably lay a piece of snake's slough in their nests—to repel, it has been suggested, marauding lizards who may thereby fear the neighbourhood of a deadly enemy. The clay-built edifices of the SWALLOW and MARTIN are known to everybody, and the NUTHATCH plasters up the gaping mouth of its nest-hole till only a postern large enough for entrance and exit, but easy of defence, is left. In South America we have the subfamily *Furnariinæ* (OVEN-BIRD), which construct of mud on the arching roots of the mangrove or the branches of other trees globular "ovens," so to speak, wherein the eggs are laid and the young hatched. The FLAMINGO erects in the marshes it frequents a mound of earth some two feet in height, with a cavity atop, on which the hen, having oviposited, is said to sit astride with dangling legs, and in that remarkable attitude perform the duty of incubation.[1] The females of the HORNBILLS, and perhaps of the HOOPOES, submit to incarceration during this interesting period, the males immuring them by a barrier of mud, leaving only a small window to admit air and food, which latter is assiduously brought to the prisoners.

But though in a general way the dictates of hereditary instinct are rigidly observed by Birds, in many species a remarkable degree of elasticity is exhibited or the rule of habit is rudely broken. Thus the noble FALCON, whose ordinary eyry is on the beetling cliff, will for the convenience of procuring prey condescend to lay its eggs on the ground in a marsh, or appropriate the nest of some other bird in a tree. The Golden EAGLE, too, remarkably adapts itself to circumstances, now rearing its young on a precipitous ledge, now on the arm of an ancient monarch of the forest, and again on a treeless plain, making a humble home amid grass and herbage. HERONS also shew the same versatility, and will breed according to circumstances in an open fen, on sea-banks or (as is most usual) on lofty trees. Such changes are easy to understand. The instinct of finding food for the family is predominant, and where most food is there will the feeders be gathered together. This explains, in all likelihood, the associated bands of OSPREYS or Fish-Hawks, which in North America breed (or used to breed) in large companies where sustenance is plentiful, though in the Old World the same species brooks not the society of aught but its mate. Birds there are of eminently social predilections. In Europe, excepting Sea-fowls—whose congregations are universal and known to all—we have perhaps but the Herons, the FIELDFARE, and the ROOK, which habitually flock during the breeding-season; but in other parts of the world many birds unite in company at that time, and in none possibly is this habit so strongly developed as in the ANIS of the Neotropical Region, the Republican Swallow of North America, and the Sociable Grosbeak (WEAVER-BIRD) of South Africa, which last joins nest to nest until the tree is said to break down under the accumulated weight of the common edifice.[1]

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[1] As before noticed (pp. 255, 256), this statement has been impugned.

In the strongest contrast to these amiable qualities is the parasitic nature of the CUCKOWS of the Old World and the COW-BIRDS of the New, but this peculiarity of theirs has been already dwelt upon. Enough to say here that the egg of the parasite is introduced into the nest of the dupe, and after the necessary incubation by the fond fool of a foster-mother the interloper successfully counterfeits the heirs, who perish miserably, victims of his superior strength. The whole process has been often watched, but the reflective naturalist will pause to ask how such a state of things came about, and there is not much to satisfy his enquiry. Certain it is that some birds whether by mistake or stupidity do not unfrequently lay their eggs in the nests of others. It is within the knowledge of many that Pheasants' eggs and Partridges' eggs are often laid in the same nest, and it is within the knowledge of the writer that Gulls' eggs have been found in the nests of EIDER-Ducks, and *vice versâ*; that a REDSTART and a Pied FLYCATCHER, or the latter and a TITMOUSE, will lay their eggs in the same convenient hole—the forest being rather deficient in such accommodation; that an OWL and a GOLDEN-EYE will resort to the same nest-box, set up by a scheming woodsman for his own advantage; and that the STARLING, which constantly dispossesses the Green Woodpecker, sometimes discovers that the rightful heir of the domicile has to be brought up by the intruding tenant. In all such cases it is not possible to say which species is so constituted as to obtain the mastery; but just as it is conceivable that in the course of ages that which was driven from its home might thrive through the fostering of its young by the invader, and thus the abandonment of domestic duties would become a direct gain to the evicted householder; so the bird which, through inadvertence or any other cause adopted the habit of casually dropping her eggs in a neighbour's nest, might thereby ensure a profitable inheritance for endless generations of her offspring. This much granted, all the rest will follow easily enough, but it must be confessed that this is only a presumption, though a presumption which seems plausible if not likely.

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[1] There are not many works on nidification, for "Caliology" or the study of nests has hardly been deemed a distinct branch of ornithological study. A good deal of instructive matter (not altogether free from error) will be found in Rennie's *Architecture of Birds* (London: 1831), and there is Mr. Wallace's most interesting dissertation, "A Theory of Birds' Nests," originally published in the *Journal of Travel and Natural History* (1868, p. 73), and reprinted in his *Contributions to the Theory of Natural Selection* (London: 1870). Andrew Murray's and the Duke of Argyll's remarks on this essay are contained in the same volume of the *Journal* named (pp. 137 and 276). The late Mr. J. G. Wood's *Homes without Hands*, perhaps the best of his books, contains a popular account of many Birds' nests, but is devoid of scientific treatment and disfigured by some glaring errors.

Incubation is performed, as is well known, by the female of nearly all Birds, but with most of the *Passeres* and many others the male seems to share her tedious duties, and among the RATITÆ, apparently without exception, the cock ordinarily takes that office on himself. There are a few groups or perhaps species in which the same practice is suspected to obtain—certain of the *Limicolæ* for instance, the GODWITS (*Limosa*), the PHALAROPES (*Phalaropus*), and the DOTTEREL (*Eudromias morinellus*)—and in these it is to be remarked that the hen is larger and more brightly coloured than her mate. Owing to the unfortunate neglect of those who have the best opportunities of making the needful observations,[1] the period of incubation has been ascertained in comparatively few birds, and it is here possible to deal with that subject only in the most vague and general language. It may be asserted that most of the smaller *Passeres* of Europe hatch their young in from 13 to 15 days, but in a few species the term is believed to be shortened to 10 or 11 days, while in the largest of that Order, the Raven, it may be lengthened to some 18 or 19 days. The Barndoor-fowl ordinarily takes 21 days, but the Pheasant, though so very nearly allied, takes two or three days longer. Most Water-birds, so far as is known, and the smaller Birds-of-Prey seem to require as long a time, but the TUBINARES are said (*Ibis*, 1892, p. 581) to take 35 days, while the Gannet needs at least 39; and in the Swan incubation lasts from 35 to 40 days, and in the Condor, according to Broderip (*Notebook of a Naturalist*, p. 14), 54 days. The temperature of the air is commonly credited with having something to do either in hastening or retarding exclusion from the egg, but to what extent, or even whether justly so or not, seems in the absence of precise experiments to be doubtful. Certain birds occasionally begin brooding so soon as the first egg is laid,[2] and this practice unquestionably has its advantages, since the offspring being of different ages thereby become less of a burthen on the parents which have to minister to their wants, while the fostering warmth of the earlier chicks can hardly fail to aid the development of those which are unhatched, during the absence of father and mother in search of food; but most birds, and it need scarcely be said, all those the young of which run from their birth, await the completion of the clutch before sitting is begun. The care bestowed, by almost every species, on the infant-brood, is proverbial, and there is hardly any extremity of danger which one at least of the anxious parents will not incur to ward off injury from their progeny.

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[1] The most valuable papers on the subject are by Mr. William Evans (*Ibis*, 1891, pp. 52-93; and 1892, pp. 55-58).

[2] This seems to be very often the case with the Owls; but, if my observation is not mistaken, the habit is not constant even with the same individual bird.

NIDIFUGÆ, a word used in this work in contradistinction to NIDICOLÆ (p. 629) to signify those Birds which are able, at hatching or immediately after, to leave the nest. They are all born with their eyes open and are thickly clothed with Neossoptiles (FEATHERS, p. 243) of simple structure, as *Alcidæ* (portion), *Anatidæ*, *Colymbi*, *Dicholophus*, *Gallinæ*, *Grues*, *Laridæ*, *Limicolæ*, *Otididæ*, *Palamedeæ*, *Phœnicopteri*, *Podicipedidæ*, *Pterocles*, *Ralli*, *Ratitæ*, *Tinami*, *Turnices*.

Opisthocomus, though born with open eyes, and able to creep about on the branches, has but few Neossoptiles and is fed by its parents.

As previously remarked (page 244) the condition of the first plumage is of little taxonomic value. This applies with still more force to the difference between *Nidicolæ* and *Nidifugæ*. Taken as a whole the latter comprise most of the phylogenetically older groups; but any of them may include some closely-allied members which have reached the developmental level of the former—the *Alcidæ*, Pigeons, Plovers and Fowls for example. Most if not all *Nidicolæ* feed their young, but there are also many *Nidifugæ* which prefer being fed by their parents though they can feed themselves—for instance the Gulls.

In order to shew the utterly useless nature of these characters in the hands of various systematists it will be enough to state that Newman considered Gulls and Birds-of-Prey to be "gymnogenous" or born naked: Bonaparte held all the *Alcidæ* and the *Sphenisci* to be "PRÆCOCES" but the *Laridæ* to be ALTRICES: Sundevall classed Herons and Storks, *Sphenisci* and *Tubinares* among the *Præcoces*; while Mr. Seebohm informs us (*Classif. B.* p. 9) that Pigeons do not pass through a downy stage.

NIGHT-HAWK, locally applied in parts of England to the NIGHTJAR, and in North America to species of the genus *Chordiles*.

NIGHT-HERON, see HERON, page 420.

NIGHTINGALE (Anglo-Saxon, *Nihtegale*, literally "singer of the night"), the bird justly celebrated beyond all others by European writers for the admirable vocal powers which, during some weeks after its return from its winter-quarters in the south, it exercises at all hours of the day and night. The song itself is indescribable, though several attempts, from the time of Aristophanes to the present, have been made to express in syllables the sound of its many notes; and its effects on those that hear it depend so much on their personal disposition as to be as varied as are its tones. To some they suggest melancholy; and many poets have discanted on the bird (which they nearly always make of the feminine gender) leaning its breast against a thorn and pouring forth its melody in anguish. It is accordingly to be observed that the cock alone sings, and that there is no reason to suppose that the cause and intent of his SONG, unsurpassed though it be, differ in any respect from that of other birds. Sadness, therefore, is certainly the last impelling sentiment that can be properly assigned in this case. In great contrast to the Nightingale's pre-eminent voice is the inconspicuous coloration of its plumage, which is alike in both sexes, and is of a reddish-brown above and dull greyish-white beneath, the breast being rather darker, and the rufous tail shewing the only bright tint. The range of this bird in Europe has already been so fully described (GEOGRAPHICAL DISTRIBUTION, pp. 339-341) as to render a further account of it needless. The Nightingale reaches its English home about the middle of April,[1] the males (as is usual among migratory birds) arriving some days before the females; and, often stopping on their way, letting their song be heard in places they do not habitually frequent, pass to their proper breeding-quarters. At this time they run very great danger from bird-catchers, for their capture is effected with facility, and it is painful to add that of those then caught nine-tenths are said to die within a month. Fortunately for the species, it receives great protection from the practice of game-preserving, which guards from intrusion so many of the localities it affects, and there is probably no country in which the Nightingale breeds more abundantly and in greater security than in England. On the cocks being joined by their partners, the work for which the long and hazardous journey of both has been undertaken is speedily begun, and before long the nest is completed. This is of a rather uncommon kind, being placed on or near the ground, the outworks consisting chiefly of a great number of dead leaves ingeniously applied together so that the plane of most is nearly vertical. The mass is wrought so as to contain in the middle a deep cup-like hollow, neatly lined with fibrous roots, but the whole is so loosely constructed, and depends for lateral support so much on the stems of the plants among which it is generally built, that a very slight touch disturbs its beautiful arrangement. Herein from four to six eggs of a deep olive colour are duly laid, and the young hatched. If the latter, when nearly fit to fly, be taken from the nest, they can with proper care be reared by hand, and this is the only justifiable mode of proceeding for those who wish to keep this fine songster in confinement, as, if the birds survive their first moult, they may live for some years in a cage, and the cocks will in due time exercise their full vocal powers. The nestling plumage of the Nightingale differs much from that of the adult, the feathers above being tipped with a buff spot, just as in the young of the REDBREAST, REDSTART and Hedge-SPARROW, thereby pointing to the affinity of all these forms. Towards the end of summer the Nightingale disappears, and but little has been observed of it in its winter-retreats, which are presumably in the interior of Africa. One of the few records of it at that season proves that it visits the Gold Coast (*Ibis*, 1872, p. 291).

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[1] Poets and novelists are apt to command at will the song of this bird, irrespective of season. If the appearance of truth is to be regarded, it is dangerous to introduce a Nightingale as singing in England before the 15th of April or after the 15th of June. The "Early Nightingale" of newspaper paragraphs is generally a Song-Thrush. Mr. Harting has pointed out to me that the well-known and beautiful passage in which Izaak Walton speaks of this bird's song is an adaptation of one in D'Arcussia's *Lettres de Philoierax à Philofalco* (No. 24); but the way in which Walton turns the idea expressed shews great superiority over the original, the words of which are "O quel doit estre le concert des Anges du Ciel, puis que ces Anges terrestres nous extasient par leurs chants?"

The Nightingale is the *Motacilla luscinia* in part of Linnæus, and the *Daulias luscinia* of some modern ornithologists. In the east of Europe a second species occurs which was not discriminated by Linnæus, though long known to German bird-fanciers as the *Sprosser*. This, the *Sylvia philomela* or *Daulias philomela* of many scientific writers, is a somewhat larger bird, which fact, and the presence of some faint spots on its breast, have caused it to receive the English name of Thrush-Nightingale. Its westward range appears to be limited to the valley of the Rhine, and the statement that it has occurred in England is erroneous. Its song is louder than that of the true Nightingale, but not so sweet in tone or so varied in note. Still further to the eastward, extending from the Caucasus through Persia to Turkestan, and occasionally occurring in winter in India, is a third species, almost simultaneously described in Berlin and Moscow as *Luscinia golzi* and *L. hafizi* (see Radde, *Orn. Caucas.* p. 247, pl. xv. and Oates, *Faun. Br. Ind. Birds*, ii. p. 101). The name Nightingale has been vaguely applied to several other birds. The so-called "Virginian Nightingale" is a species of GROSBEAK (p. 387), and the REDWING, strangely enough, has been often spoken of as the "Swedish Nightingale."[1]

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[1] The Nightingale holds a place in classical mythology. Procne and Philomela were the daughters of Pandion, king of Attica, who in return for warlike aid rendered him by Tereus, king of Daulis in Thrace, gave him the first-named in marriage. Tereus, however, being enamoured of her sister, feigned that his wife was dead, and induced Philomela to take her place. On her discovering the

NIGHTJAR or GOATSUCKER, a bird from very ancient times absurdly believed to have the habit implied by one of the common names it bears in many European tongues besides our own—as testified by the Greek Αἰγοθήλας, the Latin *Caprimulgus*, Italian *Succiacapre*, Spanish *Chotacabras*, French *Tettechèvre*, and German *Ziegenmelker*. It is admittedly the type of a very peculiar and distinct Family, *Caprimulgidæ*, a group remarkable for the flat head, enormously wide mouth, large eyes, and soft, pencilled plumage of its members, which vary in size from that of a Lark to that of a Jay. Its position has been variously assigned by systematists. Prof. Huxley considered it to form, with two other Families—the *Cypselidæ* (SWIFT) and *Trochilidæ* (HUMMING-BIRD)—the division CYPSELOMORPHÆ. The same view was taken in 1884 by Dr. Reichenow; but in 1885 Dr. Stejneger proposed to place it in a "Superorder" *Coracoideæ* along with *Steatornis* (GUACHARO), *Coraciidæ* (ROLLER) and *Leptosomatidæ*; while in 1888, Prof. Fürbringer put it between the Rollers and OWLS, with which it forms in his opinion a group *Coraciiformes*. There are two ways of regarding the *Caprimulgidæ*—one including the genus *Podargus* (MOREPORK) and its allies, the other recognizing them as a distinct Family, *Podargidæ*, as is done among others by Mr. Hartert (*Cat. B. Brit. Mus.* xvi. pp. 519-654). As a matter of convenience the last are here comprehended in the *Caprimulgidæ*, which will then contain two subfamilies, *Caprimulginæ* and *Podarginæ*; for what, according to older authors, constitutes a third, though represented only by *Steatornis*, the singular GUACHARO or Oil-bird, certainly requires separation as an independent Family.

Some of the differences between the *Caprimulginæ* and *Podarginæ* were pointed out by Mr. Sclater (*Proc. Zool. Soc.* 1866, p. 123), and are very obvious. In the former, the outer toes have *four* phalanges only, thus presenting a very uncommon character among Birds, and the middle claws are pectinated; while in the latter the normal number of five phalanges is found, the claws are smooth, and other distinctions more recondite have also been indicated by him (*tom. cit.* p. 582). The *Caprimulginæ* may be further divided into those having the gape thickly beset by strong bristles, and those in which there are few such bristles or none—the former containing the

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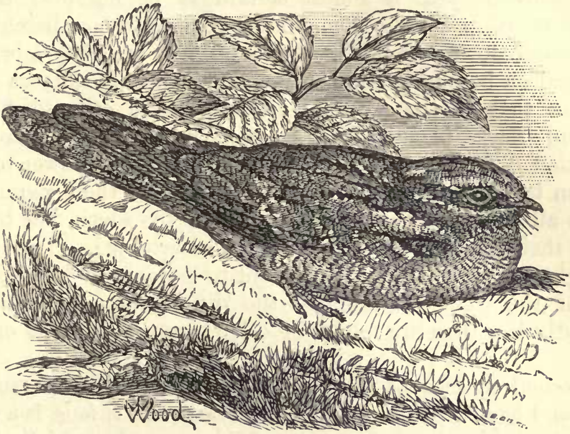
truth, he cut out her tongue to hinder her from revealing his deceit; but she depicted her sad story on a robe which she sent to Procne; and the two sisters then contrived a horrible revenge for the infidelity of Tereus, by killing and serving to him at table his son Itys. Thereupon the gods interposed, changing Tereus into a Hoopoe, Procne into a Swallow, and Philomela into a Nightingale, while Itys was restored to life as a Pheasant, and Pandion (who had died of grief at his daughters' dishonour) as a Bird-of-Prey (see OSPREY). The fable has several variants. Ovid's version may be seen in the 6th Book of his *Metamorphoses* (lines 412-676).

genera *Caprimulgus*, *Antrostomus*, *Nyctidromus*, and others, and the latter *Podager*, *Chordiles*, *Lyncornis*, and a few more.

The common Nightjar of Europe, *C. europæus*, arrives late in spring from its winter retreat in Africa, and its presence is soon made known to us by its habit of chasing its prey, consisting chiefly of moths and cockchafers, in the evening-twilight. As the season advances the song of the cock, from its singularity, attracts attention amid all rural sounds. It seems to be always uttered when the bird is at rest, though the contrary has been asserted, and is the continuous repetition of a single burring note, as of a thin lath fixed at one end and in a state of vibration at the other, loud enough to reach in still weather a distance of half-a-mile or more. On the wing, while toying with its mate, or performing its rapid evolutions round the trees where it finds its food, the bird has the habit of occasionally producing another and equally extraordinary sound, sudden and short, but somewhat resembling that made by swinging a thong in the air, though in what way this noise is produced is not ascertained. In general its flight is silent, but at times when disturbed from its repose, its wings may be heard to smite together. The Nightjar or, to use perhaps its commoner English name, Goatsucker,[1] passes the day in slumber, crouching on the ground or perching on a tree—in the latter case sitting not across the branch but lengthways, with its head lower than its body. In hot weather, however, its song may sometimes be heard by day and even at noontide, but it is then uttered, as it were, drowsily, and without the



NIGHTJAR, *Caprimulgus europæus*.

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[1] Other English names of the bird are Churn-Owl, Evejar, Fern-Owl, Night-Hawk, Puckeridge and Wheel-bird—the last from the bird's song resembling the noise made by a spinning-wheel in motion.

vigour that characterizes its crepuscular or nocturnal performance. Towards evening the bird becomes active, and it seems to pursue its prey throughout the night uninterruptedly, or only occasionally pausing for a few seconds to alight on a bare spot—a pathway or road—and then resuming its career. It is one of the few birds that absolutely make no nest, but lays its pair of beautifully-marbled eggs on the ground, generally where the herbage is short, and often actually on the soil. So light is it that the act of brooding, even where there is some vegetable growth, produces no visible depression of the grass, moss, or lichens on which the eggs rest, and the finest sand almost equally fails to exhibit a trace of the parental act. Yet scarcely any bird shows greater local attachment, and the precise site chosen one year is almost certain to be occupied the next (NIDIFICATION, p. 630). The young, covered when hatched with dark-spotted down, are not easily found, nor are they more easily discovered on becoming fledged, for their plumage almost entirely resembles that of the adults, being a mixture of reddish-brown, grey, and black, blended and mottled in a manner that passes description. They soon attain their full size and power of flight, and then take to the same manner of life as their parents. In autumn all leave their summer haunts for the south, but the exact time of their departure has hardly been ascertained. The habits of the Nightjar, as thus described, seem to be more or less essentially those of the whole subfamily—the differences observable being apparently less than are found in other groups of birds of similar extent.

A second species of Nightjar, *C. ruficollis*, which is somewhat larger, and has the neck distinctly marked with rufous, is a summer visitant to the south-western parts of Europe, and especially to Spain and Portugal. Hancock recorded (*Ibis*, 1862, p. 39) the occurrence of a single example of this bird at Killingworth, near Newcastle-on-Tyne, in October 1856; but the season of its appearance argues the likelihood of its being but a casual straggler from its proper home.[1] Many other species of *Caprimulgus* inhabit Africa, Asia and their islands, while one, *C. macrurus*, ranges very widely and is found in Australia. Very closely allied to this genus is *Antrostomus*,[2] an American group containing several species, of which the Chuck-will's-widow, *A. carolinensis*, and the Whip-poor-will, *A. vociferus*, of the eastern United States (the latter also reaching Canada) are familiar examples. Both these birds take their common name from the cry they utter, and their habits seem to be almost identical with those of the Old-World Nightjars. Passing over some other forms which need not here be mentioned, the genus *Nyctidromus*, though consisting of only one species (*N. albicollis*) which, though varying somewhat in size and coloration, ranges from Texas to Southern Brazil, requires remark, since it has tarsi of sufficient length to enable it to run swiftly on the ground, while the legs of most birds of the Family are so short that they can make but a shuffling progress. The South-American *Heleothreptes*, with the peculiar form of wing (counting from the wrist, in which the 2nd, 3rd, and 4th primaries are greatly elongated) possessed by the male, needs mention; but a still more exaggerated condition exists in two African species, referred by some ornithologists to as many genera (*Macrodipteryx* and *Cosmetornis*) though probably one genus would suffice for both. The males of each of them are characterized by the wonderful development of the 2nd primary, which reaches in adult specimens the extraordinary length of 17 inches or more. The former of these, the *Caprimulgus macrodipterus* of Afzelius, seems to have the more northern range, occurring across the continent from Abyssinia to the West Coast, and the shaft of the elongated remiges is bare for the greater part of its length, retaining the web, in a spatulate form, only near the tip. The latter, to which the specific name of *vexillarius* was given by Mr. Gould, inhabits equatorial Africa, and thence to Damaraland on

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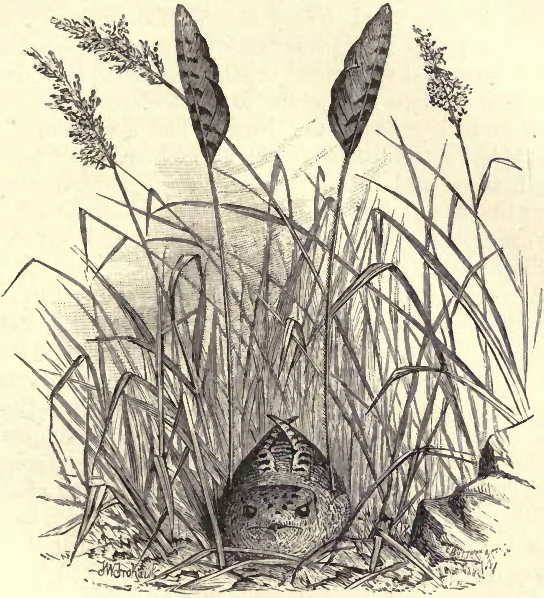
[1] A third species, *C. ægyptius*, recognizable by its pale coloration, has occurred about half a dozen times in Europe, and once even in England (*Zool.* 1883, pp. 374, 375).

[2] Mr. Hartert (*op. cit.* p. 521) denies its generic validity, and not unjustifiably.



Pennant-winged Nightjar, *Macrodipteryx*.
(After sketch from life by J. Gedge.)

the east and Fernando Po on the west, and is reported to have occurred in Madagascar and Socotra. In this the remigial streamers do not lose their barbs, and as a few of the next quills are also to some extent elongated, the bird, when flying, is said to look as though it had four wings. Specimens of both are rare in collections, and no traveller seems to have had the opportunity of studying the habits of either so as to suggest a reason for this marvellous sexual development, though the late Mr. Joseph Gedge, who accompanied Sir Samuel Baker's expedition to the Soudan, on one occasion observed a *Macrodipteryx* squatting on the ground with its long remiges erected perpendicularly, and the accompanying figure is from a sketch sent by him to his friend Mr. Marlborough Pryor.

The second group of *Caprimulginæ*, those which are but poorly or not at all furnished with rictal bristles, contains about five genera, of which there is here only room to particularize *Lyncornis* of the Old World and *Chordiles* of the New. The species of the former are remarkable for the tuft of feathers which springs from each side of the head, above and behind the ears, so as to give the bird an appearance like some of the "Horned" OWLS—those of the genus *Scops*, for example; and remarkable as it is to find certain forms of two Families, so distinct as are the *Strigidæ* and the *Caprimulgidæ*, resembling each other in this singular external feature, it is yet more remarkable to note that in some groups of the latter, as in some of the former, a very curious kind of DIMORPHISM takes place. In either case this has been frequently asserted to be sexual, but on that point doubt may be fairly entertained. Certain it is that in some groups of Nightjars, as in some groups of Owls, individuals of the same species are found in plumage of two entirely different hues—rufous and grey. The only explanation as yet offered of this fact is that the difference is sexual, but, as just hinted, evidence to that effect is conflicting. It must not, however, be supposed that this common feature, any more than that of the existence of tufted forms in each group, indicates any close relationship between them. The resemblances may be due to the same causes, concerning which future observers may possibly enlighten us, but at present we must regard them as analogies, not homologies. The species of *Lyncornis* inhabit the Malay countries, one, however, occurring in Burma and India. Of *Chordiles* the best-known species is the Night-hawk of North America, *C. virginianus* or *popetue*, which has a wide range from Canada to Brazil. Others are found in the Antilles and in South America.

We have next to consider the birds forming the genus *Podargus* and those allied to it, whether they be regarded as a distinct Family, or as a subfamily of *Caprimulgidæ*. As above stated, they have feet constructed as those of Birds normally are, and their sternum seems to present the constant though comparatively trivial difference of having its posterior margin elongated into two pairs of processes, while only one pair is found in the *Caprimulginæ*. *Podargus* includes the bird, *P. cuvieri*, known from its cry as Morepork to Tasmanian colonists, and several other species, the number of which is doubtful, from Australia and New Guinea. They have comparatively powerful bills, and, it would seem, feed to some extent on fruits and berries, though they mainly subsist on insects, chiefly *Cicadæ* and *Phasmidæ*. They also differ from the true Nightjars in having the outer toes partially reversible, and they are said to build a flat nest on the horizontal branch of a tree for the reception of their eggs, which are of a spotless white. Apparently allied to *Podargus*, but differing among other respects in its mode of nidification, is *Ægotheles*, which belongs also to the Australian Region; and further to the northward, extending throughout the Malay Archipelago and into India, comes *Batrachostomus*, wherein we again meet with species having "ear"-tufts somewhat like *Lyncornis*. The *Podarginæ* are thought by some to be represented in the New World by the genus *Nyctibius*, of which several species occur from the Antilles and Central America to Brazil. Finally, it may be stated that none of the *Caprimulgidæ* seem to occur in Polynesia or in New Zealand, though there is scarcely any other part of the world suited to their habits in which members of the family are not found.

NIGHT-RAVEN, a bird frequently met with in fiction, but apparently nowhere else.

NINE-KILLER or NINE-MURDER, old and obsolete renderings of the German *Neuntödter* or *Neunmörder*, names applied to more than one species of *Lanius* (SHRIKE) and due to the belief that each of the shambles of one of these birds displays the remains of nine victims ("Nimmurder" by misprint, Cotgrave, 1611, *sub voce* "Escriere").

NODDY, the name applied, originally by sailors, to a sea-bird from its shewing so little fear of man as to be accounted stupid.[1] It is the *Sterna stolida* of Linnæus, and the *Anous stolidus* of modern ornithology, having the figure of a TERN, and belonging to the subfamily *Sterninæ*, but is heavier in flight, with shorter wings and the tail less deeply forked. The plumage is of a uniform sooty hue, excepting the crown of the head, which is light grey. The Noddy is very generally distributed throughout the tropical or nearly tropical oceans, but occasionally wanders into colder climates, and has been met with even in the Irish Sea. It breeds often in astounding numbers, on islands, even low cays and coral-islets, commonly making a shallow nest of sea-weed or small twigs, which may be placed on the ground, on a tuft of grass, or in the fork of a tree, while sometimes it lays its eggs on a bare rock. Mr. Saunders (*Proc. Zool. Soc.* 1876, pp. 669-672) admitted four other species of the genus:—*Anous tenuirostris*, supposed to be confined to the southern part of the Indian Ocean, from Madagascar to West Australia; *A. melanogenys*, often confounded with the last, but having nearly as wide a range as the first;[1] and *A. leucocapillus*, hitherto known only from Torres Strait and the Southern Pacific. These three have much resemblance to *A. stolidus*, but are smaller in size, and the two latter, which have the crown white instead of grey, are now considered to be identical. The fourth species, *A. cæruleus*, with which he then included the *A. cinereus* of some authors, but subsequently (*op. cit.* 1878, pp. 211, 212) recognized the last as distinct, differs not inconsiderably, being of a dove-colour, lighter on the head and darker on the back, the wings bearing a narrow white bar, with their quill-feathers blackish-brown, while the feet are reddish and the webs yellow. Three more species—*A. superciliosus* from the Caribbean Sea and Gulf of Mexico, *A. plumbeigularis* from the Red Sea, and *A. galapagensis* from the Galapagos—were added by Dr. Sharpe (*Philos. Trans.* clxviii. pp. 468, 469); while Mr. Rothschild has described and figured (*Avifauna of Laysan*, p. 43, pl.) the birds which frequent the Sandwich Islands as forming a tenth—*A. hawaiiensis.*

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[1] *Nodden*, used by Chaucer, the old form of *nod*, is to drop the head suddenly as in falling asleep, and hence comes Sir Thomas Browne's *nodipol*—a sleepy head, a simpleton—the modern *noodle*. *Noddle*, a jocular word for the head, is possibly allied, as I am told by Prof. Skeat.

NONPAREIL, the name under which, from its supposed matchless beauty, a little cage-bird, chiefly imported from New Orleans, has long been known to English dealers (*cf.* Edwards, *Gleanings*, i. p. 132). It is the *Emberiza ciris* of Linnæus and the *Cyanospiza*, *Spiza* or *Passerina ciris* of recent ornithologists, belonging to a small group, which, in the present state of knowledge, cannot with certainty be referred either to the Buntings or to the Finches, while some authors have regarded it as a TANAGER. The cock has the head, neck, and lesser wing-coverts bright blue, the upper part of the back yellow, deepening into green, and the lower parts generally, together with the rump, bright scarlet, tinged on the latter with purple. This gorgeous colouring is not assumed until the bird is at least two years old. The hen is green above and yellow beneath; and the younger cocks present an appearance intermediate between the adults of either sex. The species, often called also the Painted Bunting, after wintering in Central America or Mexico, arrives in the southern States of the American Union in April, but does not ordinarily proceed to the northward of South Carolina. In

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[1] According to information supplied to Dr. F. Penrose (*Ibis*, 1879, p. 280) this species took up a station in 1878 on the Island of Ascension in large numbers, it having been hitherto unknown there.

Louisiana, where it is especially the *Pape* of the French-speaking inhabitants (see BISHOP-BIRD, page 40) it is said to be very abundant; and on its appearance in spring advantage is, or was, taken of the pugnacious disposition of the males (which so often accompanies a brilliant sexually-distinct plumage) to capture them alive in great numbers by means of the stuffed skin of one so placed in connexion with a cage-trap that they instantly fall into the latter on attacking what they conceive to be a rival. In this way many thousands are said to have been taken formerly. The prisoner usually reconciles himself to his fate, and in a few days will utter his sprightly though not very powerful song; and, if provided with a mate and proper accommodation, will breed and rear a family in confinement. Belonging to the same genus as the Nonpareil is the INDIGO-BIRD, *Cyanospiza cyanea*, which, as a summer visitant, is widely diffused from the Missouri to the Atlantic, and extends into the provinces of Ontario and New Brunswick, being everywhere regarded with favour. Though wanting most of the bright hues of its congener, the Indigo-bird has yet much beauty, the adult cock being nearly all over of a deep blue, changing, according to the light, to green. The hen is brown above and ochreous-white beneath. This species is represented in the western part of the continent by the Lazuli-Finch, *C. amœna*, the male of which has the upper parts greenish-blue, the wings barred with white, a pectoral band of light chestnut extending to the flanks on each side, and the lower parts white. Of the three remaining species of the genus, *C. versicolor* shews in the male a plumage beautifully varied with brownish-red, violet, and blue; *C. leclancheri* is bluish-green above and yellow beneath, with an orange breast; while *C. rositæ*, though quite distinct, comes nearest in coloration to *C. ciris*. These three have a more southern range than the other three; but the first of them is believed occasionally to cross the Mexican frontier into the United States. None of the species of *Cyanospiza* are thought to occur further south than the isthmus of Panama; but the wonderful *Ciridops anna* of Hawaii (Wilson and Evans, *Birds of the Sandwich Islands*) is possibly allied to this genus.

NOPE, a name of the BULLFINCH, said to be an old corruption of ALP or some other form of that word (see page 10) which has taken on an initial *n* borrowed from the indefinite article *an*.[1]

NORFOLK PLOVER, a needless book-name for the STONE-CURLEW (see page 129), apparently invented by Pennant in 1766.

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[1] Like *a newt* for "an ewt" (or eft), *a nickname* for "an ekename," *a noke* for "an oak," and several other words (*cf.* Skeat, *Etymol. Dict. sub litt.* N); but the only case among English birds' names where the converse process, or loss of a real initial *n*, has happened as in *adder* for "nadder," *auger* for "nauger," seems to be that of *eyas* for "NIAS."

NULLIPENNES, Lesson's name in 1831 (*Tr. d'Orn.* p. 11) for a group of birds to consist of the genus *Apteryx* (KIWI); but lately applied in error (*Century Dictionary, sub voce*) to the PENGUINS.

NUN (printed "Non" in Merrett's *Pinax*, p. 183), the adult male SMEW, from his delicate white and black plumage, and also said to be a local name of the Blue Titmouse, *Parus cæruleus*, according to Charleton (*Onomast.* p. 90), from its banded head; but the French *Nonnette* and the German *Nonnenmeise* are names of the Marsh-Titmouse, *P. palustris.*

NUTCRACKER, the name given in 1758 by Edwards (*Gleanings*, i. p. 63, pl. 240) to a bird which had hitherto none in English, though described in 1544 by Turner, who, meeting with it in the Rhætic Alps, where it was called "Nousbrecher" (*hodie* "Nussbrecher"), translated that word into Latin as *Nucifraga.* In 1555 Gesner figured it and conferred upon it another designation, *Caryocatactes.* Willughby and Ray obtained it on the road from Vienna to Venice as they crossed what must have been the Sömmerring Pass, 26th September 1663; and it has a wide range in the northern parts of the Palæarctic area, chiefly keeping to subalpine or subarctic pine-forests, and apparently nowhere numerous, though roving bands of seventy or one hundred have occasionally been observed in autumn, at which season it can be often seen in suitable localities in several European countries. It is the *Corvus caryocatactes* of Linnæus, the *Nucifraga caryocatactes* of modern ornithology.[1] The first known to have occurred in Britain was, according to Pennant, shot at Mostyn in Flintshire, 5th October 1753, while about fifteen more examples have since been procured, and others seen, in this island. For many years nothing was known of this bird during the breeding-season, when it seemed to disappear from sight, and this notwithstanding the interest taken in the search for its nest and eggs. It is now pretty clear that the discovery was due to the Abbé Caire of Sanières in the Lower Alps, but though he obtained an egg in 1846, he was unable to produce proof of the fact, and the truth was not ascertained until some sixteen years later by the Danish oologists HH. Fischer and Erichsen, who after much labour found and took nests and eggs in the island of Bornholm.[2] The Nutcracker breeds very early in the year, long before the snows are melted, and this fact coupled with that of its becoming, like a JAY, silent in the breeding-season, when at other times it is rather noisy than not, will account for the mystery which so long enwrapped its domestic arrangements; but, now that the secret has been divulged, nests and eggs have been found without much difficulty in various parts of Europe, and contrary to what was for many years believed, the nest seems to be invariably built on the bough of a tree, some 20 feet from the ground, and is a comparatively large structure of sticks lined with grass. The eggs are of a very pale bluish-green, sometimes nearly spotless, but usually more or less freckled with pale olive or ash-colour. The chief food of the Nutcracker, though it at times searches for insects on the ground, appears to be the seeds of fir-trees, which it extracts as it holds the cones in its foot, and it has been questioned whether the bird has the faculty of cracking nuts—properly so called—with its bill, though that can be used with much force and, at least in confinement, with no little ingenuity. Considerable difference has been observed in the form and size of the bill of examples of this species, but as in the case of the HUIA (page 437) this is now supposed to depend on the sex—that of the cock being stout and short, while in the hen it is long and thin. The bird is about the size of a Jay, and of a dark sooty-brown colour spangled with white, nearly each body-feather ending in a tear-shaped patch of that colour. Beside the European species, which also extends into Northern or Central Asia, three others, very nearly akin to it, have been described from the Himalayas. Of their American cousin, Clark's Crow, as it is called (*Picicorvus columbianus*), inhabiting only the western slopes of the Rocky Mountains, and discovered during the famous expedition of Lewis and Clark to the mouth of the Columbia River in 1804-6, an excellent account has been given by Dr. Coues (*Ibis*, 1872, pp. 52-59).

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[1] A monograph of the species by the Ritter Victor von Tschusi-Schmidhoffen was printed at Dresden in 1874 with the title of *Der Tannenheher*, one of its many German names.

[2] Many other claimants appeared in the meanwhile without making good their pretensions. The story of the discovery is told with some details in Yarrell's *British Birds* (ed. 4, ii. pp. 332-337). The egg of the Nutcracker seems to have been first figured by Bädeker (*Journ. für Orn.* 1856, pl. i. fig. 1), but the first specimen with an undeniable history, being from Bornholm as above stated, in the *Proceedings of the Zoological Society* (1867, pl. xv. fig. 2).

The old supposition that the Nut-crackers had any affinity to the *Picidæ* (WOODPECKER) or were intermediate in position between them and the *Corvidæ* (CROW) is now known to be wholly erroneous, for they undoubtedly belong to the latter Family.

NUTHATCH, in older English NUTHACK, and locally NUTJOBBER, from its habit of hacking or chipping nuts, which it cleverly fixes, as though in a vice, in a chink or crevice of the bark of a tree, and then hammers them with the sharp point of its bill till the shell is broken. This bird was long thought to be the *Sitta europæa* of Linnæus; but that is now admitted to be the northern form, with the lower parts white, and its buff-breasted representative in central, southern, and western Europe, including England, is known as *Sitta cæsia*. It is not found in Ireland, and in Scotland its appearance is merely accidental. Without being very plentiful anywhere, it is generally distributed in suitable localities throughout its range—those localities being such as afford it a sufficient supply of food, consisting during the greater part of the year of insects, which it diligently seeks on the boles and larger limbs of old trees; but in autumn and winter it feeds on nuts, beech-mast, the stones of yew-berries and hard seeds. Being of a bold disposition, and the trees favouring its mode of life often growing near houses, it will become on slight encouragement familiar with men; and its neat attire of ash-grey and warm buff, together with its sprightly gestures, render it an attractive visitor. It generally makes its nest in a hollow branch, plastering up the opening with clay, leaving only a circular hole just large enough to afford entrance and exit; and the interior contains a bed of dry leaves or the filmy flakes of the inner bark of a fir or cedar, on which the eggs are laid. Corsica has a Nuthatch peculiar to itself and remarkable for its black crown, the *S. whiteheadi* of Dr. Sharpe, and in the Levant occurs a third species, *S. syriaca*, with somewhat different habits, as it haunts rocks rather than trees; while four or five representatives of the European arboreal species have their respective ranges from Asia Minor to the Himalayas and Northern China. North America possesses nearly as many; but, curiously enough, the geographical difference of coloration is just the reverse of what it is in Europe—the species with a deep rufous breast, *S. canadensis*, being that which has the most northern range, while the white-bellied *S. carolinensis*, with its western form, *S. aculeata*, inhabits more southern latitudes. The Ethiopian Region seems to have no representative of the group, unless it be the *Hypositta corallirostris* of Madagascar. *Callisitta* and *Dendrophila* are nearly allied genera, inhabiting the Indian Region, and remarkable for their beautiful blue plumage; but some doubt may for the present be entertained as to the affinity of the Australian *Sittella*, with four or five species, found in one or another part of that continent, which doubt is increased by the late Mr. W. A. Forbes's discovery (*Proc. Zool. Soc.* 1882, pp. 569-571) that the genera *Acanthidositta* (SPINEBILL) and *Xenicus*, peculiar to New Zealand, and hitherto generally placed in the Family *Sittidæ*, belong really to the Mesomyodian group and are therefore far removed from it. The true *Sittidæ* seem to be intermediate between the *Paridæ* (TITMOUSE) and the *Certhiidæ* (TREECREEPER), and some authors comprehend them in either one or the other of those groups.

NUTMEG-BIRD, the dealers' name in common use for *Munia punctulata* (COWRY-BIRD, page 108), but apparently of somewhat recent origin.

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OAT-FOWL, a local name for the Snow-BUNTING; OATSEED-BIRD for the Yellow WAGTAIL.

OCCIPUT, properly the hinder part of a bird's head, from the crown backward, as opposed to SINCIPUT, but often used vaguely for the whole cap.

OCTOBER BIRD, in the Antilles used for the BOBOLINK, from its arriving there in that month (B. Edwards, *Hist. W. Ind.* i. p. 99, note).

OCYDROME, see WEKA.

ODONTOGLOSSÆ, Nitzsch's name in 1840 (*Pterylographie*, p. 191) for a group consisting of the genus *Phœnicopterus* (FLAMINGO).

ODONTOLCÆ, see ODONTORNITHES.

ODONTOPHORINÆ, the supposed subfamily containing the American QUAILS (*cf.* COLIN), upon the distinctness of which from those of the Old World some systematists have laid unnecessary importance. Dr. Coues (*Key N.-Am. Birds*, ed. 1884, p. 594) says that he knows no characters to distinguish the true Quails from the so-called *Odontophorinæ*.

ODONTORNITHES,[1] a term proposed in 1873 by Prof. Marsh (*Am. Journ. Sci.* ser. 3, v. pp. 161, 162) to designate a so-called Subclass of birds, consisting of the genera *Hesperornis* and *Ichthyornis* (both of which had been named in the previous year) from the cretaceous deposits of Kansas, and characterized by the presence of teeth (Fig. 1). Its founder afterwards subdivided this group (*op. cit.* x. pp. 403-408) into the two Orders ODONTOLCÆ and ODONTOTORMÆ; the former, represented by *Hesperornis* and characterized by having the teeth (Fig. 2) placed in grooves, heterocœlous vertebræ, and the abortion of the carina sterni with a generally Ratite conformation of the scapular arch (Fig. 3); while the latter, typified by *Ichthyornis*, was distinguished by the presence of distinct sockets for the teeth (Fig. 5), amphicœlous vertebræ (Fig. 6), and the Carinate modification of the sternal apparatus. Subsequent writers have disputed the expediency of this proposal, for Prof. Cope in 1875 (*Vert. Cretac. Form. of the West*, pt. iii. p. 245) and Prof. Seeley in 1876 (*Q. Journ.*

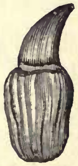

Fig. 1. TOOTH OF HESPERORNIS. (From Nicholson and Lydekker's *Palæontology*, after Marsh.)

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[1] Again indebted to Mr. Lydekker's kindness for an article worthy of the closest attention, I wish to guard myself against its being taken as the expression of my own views on one of the hardest subjects that the ornithologist has to consider, and one still open to various interpretations.—A. N.

Geol. Soc. xxxii. p. 496) referred *Hesperornis* to the "*Natatores.*" In 1881, M. Dollo (*Bull. sc. Départ. du Nord*, ser. 2, iv. p. 300) pronounced it to be "une autruche carnivore aquatique." This notion was popularized in 1884 by Prof. Wiedersheim (*Biolog. Centralbl.* ii. p. 690), while Prof. Dames in the same year (*Palæontol. Abhandl.* ii. pt. 3) took much the same view, as did also (though in a different fashion) an author in the *Encyclopædia Britannica* (ed. 9, xviii. pp. 43, 44), and Prof. von Zittel (*Handb. Palæozool.* Abth. I. iii. pp. 826, 834). Almost simultaneously, however, Prof. Vetter (*Festschr. der Ges. Isis in Dresden*, 1885, p. 109) explained *Hesperornis* as a Carinate Bird, exclusively adapted to aquatic life, and having no affinity to the *Ratitæ*, though since he regarded these last as reduced *Carinatæ* its mutual relation to the *Ratitæ* was obvious, and people began to confound them, speaking almost in M. Dollo's

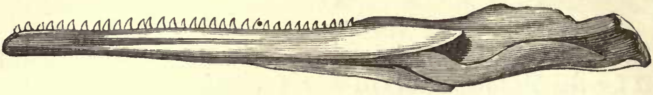

Fig. 2.—Mandible of Hesperornis. (As before, after Marsh.)

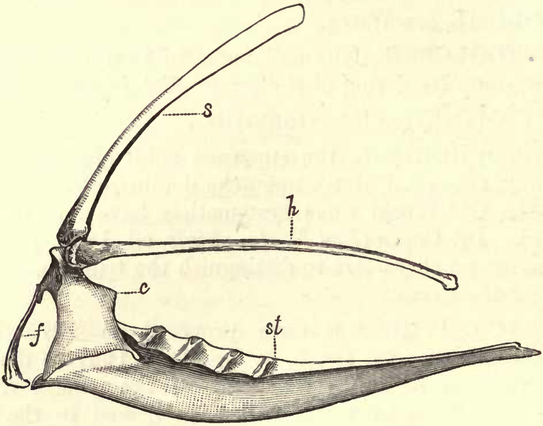

Fig. 3.—Sternal Apparatus of Hesperornis. (As before, after Marsh.)
c coracoid; *f*, furcula; *h*, humerus; *s*, scapula; *st*. sternum.

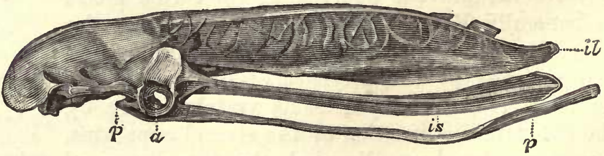

Fig. 4.—Pelvis of Hesperornis. (As before, after Marsh.)
a, acetabulum; *il*. ilium; *is*. ischium; *p*, pectineal process; *p′*, os pubis.

phrase of it as a "Swimming Ostrich." About the same time it was found that the presence of teeth was a character apparently common to all "Cretaceous" Birds. The opinions expressed by Prof. Fürbringer in the earlier portion of his great work need not be here adduced, since they were modified in the course of its progress; but he finally declared (*Untersuchungen*, u. s. w. pp. 1543, 1565, 1580) that the *Odontolcæ* were the ancestral relations of his "Colymbo-Podicipites," with which they formed his Suborder "Podicipitiformes," while a similar view was taken in 1890 by Prof. D'Arcy Thompson (*Stud. Mus. Dundee*, No. 10).

As to the *Odontotormæ* Prof. Marsh has displayed commendable caution. On account of some similarity, the significance of which may or may not be important, he based his restoration of *Ichthyornis* on *Sterna* (TERN), a fact which has led to exaggerated if not mistaken views, for he was careful to state that *Ichthyornis* seemed to have points of resemblance to *Ardea*, *Ciconia*, *Colymbus*, *Phalacrocorax* and even to the *Accipitres*, while its posterior extremities alone indicated a structure similar to that of the *Laridæ* and *Alcidæ*. In 1893 Dr. Gadow (*Thier-reich*, *Vögel*, ii. p. 119) suggested that the low characters of *Ichthyornis* shew it to be the beginning of the *Carinatæ*.

In 1891 the present writer (*Cat. Foss. B. Br. Mus.* pp. 200 *et seqq.*), while fully admitting both the Colymbine affinities of *Hesperornis* and the Larine resemblances of *Ichthyornis*, proposed to retain the term *Odontornithes* for a *series* of Birds ancestral to the modern *series* of toothless *Carinatæ*, adopting (*op. cit.* p. 2) for the latter, but in a wider sense, Dr. Stejneger's name (*Stand. Nat. Hist.* iv. p. 64) of *Euornithes*. In addition to the presence of teeth, the extinct series differs from the *Euornithes* by the absence of union between the rami of the mandible, and between the distal ends of the ilium and ischium.

Whatever may be the ultimate verdict on these points of classification, it would seem probable that *Hesperornis* should be regarded as an offshoot from the same ancestral stock as the one from which the modern *Colymbidæ* have originated; such ancestral stock being characterized by the presence of teeth, absence of ancylosis between the mandibular rami, and want of union between the spike-like patella and the upwardly-produced cnemial crest of the tibia. On the other hand, the abortion of the keel of the sternum, as well as the general Ratite modification of the scapular arch, are features peculiar to *Hesperornis*, and not common to the ancestral type; being, in fact, nearly analogous to those presented by *Didus* among the *Columbæ*. The typical species of *Hesperornis* (*H. regalis*) was of large size, attaining a length of about six feet; while a second species (*H. crassipes*) was still more gigantic. Both were aquatic, and probably very similar in their general habits to the Divers. Probably more or less closely allied to this genus was the much smaller Colymbiform bird from the Cambridge

Greensand, named by Prof. Seeley in 1869 *Enaliornis*, and the closely allied *Baptornis* from the North American Cretaceous (see FOSSIL BIRDS). While possessing heterocœlous cervicals, it is believed that *Enaliornis* had its dorsal vertebræ amphicœlous.

Retaining in their amphicœlous vertebræ evidence of their reptilian ancestry which is lost in the more specialized *Hesperornis*, the small Gull-like birds known as *Ichthyornis* may probably be regarded as holding a somewhat more intimate relationship to the modern LIMICOLÆ and GAVIÆ than is presented by the former to the PYGOPODES, the specialization connected with the absence of flight in the former genus being wanting. Traces of affinity with *Ichthyornis* are, indeed, indicated by the more or less markedly opisthocœlous dorsal vertebræ of the *Limicolæ* and *Gaviæ*; but whereas both these groups have an ectepicondylar process to the humerus, and an extensor bony bridge to the tibio-tarsus, neither of these features are present in the cretaceous genus. The fenestration of the metacarpus characteristic of the *Gaviæ* is, moreover, wanting in *Ichthyornis*. Hence it would appear that we must regard all the above-mentioned features characterizing the existing groups named as of comparatively late origin; while the differences between the extinct and living forms appear to the writer far too important to admit, as has been proposed, of their inclusion in a single ordinal group. Although *Apatornis*, from the Yellow Chalk of Kansas, and as yet imperfectly known, was apparently an allied type, distinguished by the great development of the acromial process of the scapula, and the stouter hind limbs, the remaining genera of (? toothed) birds from the same horizon referred to the *Odontornithes* are named on the evidence of such incomplete remains, that it is impossible to speak of their affinities with certainty; all that can be said for them will be found in their describer's magnificent work forming the first volume of the *Memoirs of the Peabody Museum of Yale College*.[1]

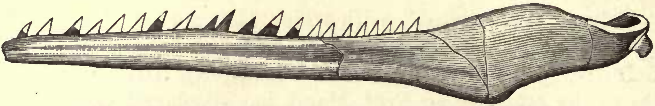

Fig. 5.—MANDIBLE OF ICHTHYORNIS. (As before after Marsh.)

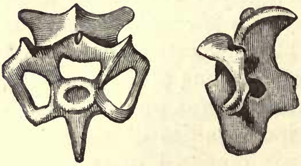

Fig. 6.

CERVICAL VERTEBRA OF ICHTHYORNIS, FROM FRONT AND SIDE.

(As before, after Marsh.)

RICHARD LYDEKKER.

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[1] *Odontornithes: a Monograph on the Extinct Toothed Birds of North America.* By Othniel Charles Marsh. Fol. New Haven, Conn.: 1880.

ODONTOTORMÆ, see ODONTORNITHES.

ŒSOPHAGUS (Greek οἰσοφάγος), so named by Aristotle, the gullet or "swallow" of plain English (*cf.* DIGESTIVE SYSTEM, page 136), the part of the alimentary canal from the LARYNX (page 512) to the STOMACH. It passes down the right and dorsal side of the TRACHEA, with which and other adjoining parts it is connected by loose tissue, entering the thoracic cavity dorsally from the BRONCHI (page 58), and when not distended it forms numerous longitudinal folds owing to the yielding nature of the *tunica mucosa* (page 137). Deglutition is aided by simple mucous glands, but in many birds the middle portion of the Œsophagus forms a permanent dilatation, the CROP (page 113), to the outer surface of which thin but broad bands of striped or voluntary muscle are generally attached. These may arise from the FURCULA (page 296) as in Pigeons, or from the skin of the neck as in the *Gallinæ*, and their action assists the conveyance of the food from the crop to the stomach. During this process, especially if only little and dry food be left, Birds, Parrots for instance, may be occasionally observed to stretch their neck and gape widely with their mouth.

OIL-BIRD, see GUACHARO.

OIL-GLAND (glandula uropygialis), in Birds the only cutaneous gland except some small organs in the external ear-passages. Consisting of two symmetrical portions, more or less united posteriorly in shape of a heart—since each half is broad and rounded in front and pointed behind—it is seated upon the levator muscles at the root of the tail. Internally it is formed of numerous secretory tubules which gradually unite in a common cavity opening on the surface through a variable number of orifices—there being from 3 to 5 of them in many Water-birds, though only one to each half in *Anseres*—frequently prolonged in form of a nipple and occasionally united in a single tube, the double origin of which is, however, shewn by a median septum. In the HOOPOE alone, according to Nitzsch, there is but one orifice to the common cavity, wherein the stinking secretion of the gland, for which the female during incubation and the young while they stay in the nest are notorious, is stored. The whole structure, which is surrounded by connective tissue and unstriped muscular fibres, is innervated by the first caudo-spinal nerves, and its blood-supply is in connexion with the caudal arteries and veins.

In the majority of Birds this gland is well developed, being largest in those of aquatic habit, and especially in the TUBINARES and STEGANOPODES, as well as in *Pandion* (OSPREY); but it is also large in *Steatornis* (GUACHARO). It exists, though hardly in a functional condition, in certain PIGEONS (*Ptilopus*), *Cacatua cristata* (COCKATOO), and most *Caprimulgi* (NIGHTJAR), while in other

Pigeons as *Didunculus* (DODLET), *Goura* and *Treron;* in other Cockatoos, in several PARROTS (*Chrysotis* and *Pionus*), in *Podargus* (NIGHTJAR), *Otis*, *Argusanus* and the *Ratitæ* it is absent. This irregularity shews that it has not much value as a taxonomic character; but attention to other peculiarities in its form or structure has been drawn by Nitzsch and Garrod, and especially to the presence or absence of a circlet of feathers surrounding the nipple-like orifice, and when that occurs the skin covering the gland is naked, while when the circlet is wanting the whole is covered with down interspersed with stiff feathers. Among the birds to which the last condition applies are the *Bucconidæ*, *Caprimulgi* (excl. *Podargus*), *Cariama*, *Coraciidæ*, *Cuculidæ*, *Cypseli*, *Galbulidæ*, *Leptosomus*, *Meropidæ*, *Momotidæ*, *Steatornis* and *Trogonidæ*, while by far the greater number of birds possess the tuft.

Analysis of the secretion of the Oil-gland shews that its composition closely resembles that of the sebaceous product of Mammals; but that it differs from milk through the absence of sugar. Its use is probably the anointing of the plumage, and the presence of POWDER-DOWNS in *Cacatua*, *Chrysotis* and *Podargus* may possibly indicate some correlation between these organs and the oil-gland.[1]

OLD MAN, the name in Jamaica for *Hyetornis pluvialis*, one of the CUCKOWS which is also called Rain-bird, as are others of the Family.

OLD SQUAW and OLD WIFE are two of the many names of the Long-tailed DUCK, the former necessarily of transatlantic origin.

OLECRANON, the proximal end of the ULNA, projecting backward from and beyond its articulation with the HUMERUS, being practically equivalent to the point of the elbow. It serves as a lever during the extension of the wings, the tendons of the triceps muscle being inserted on the Olecranon.

OLIGOMYODÆ, Prof. Huxley's name (*Proc. Zool. Soc.* 1867, p. 471) for the group of Passerine Birds having but few song-muscles (SYRINX) which Johannes Müller had previously called PICARII.

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[1] It seems that it would be improper here to overlook a controversy on this still unsettled question which, though now wholly forgotten, was carried on, to the amusement of our predecessors, in the later volumes of Loudon's *Magazine of Natural History*, and in the early years of *The Zoologist.* Waterton, with the mistaken zeal he so frequently exhibited, maintained that the gland had no lubricating function, chiefly because he had observed that the so-called "rumpless" breed of Fowls, in which the gland is wanting, kept their feathers as glossy as other Fowls which possessed it. He was easily victorious so long as he had to deal only with the late Mr. F. O. Morris, but when he met with an adversary like the late Mr. C. A. Bury, who knew something about birds, was a good observer and could write rationally, Waterton's mistaken position seems to have become plain to him, and he retired from the contest.—A. N.

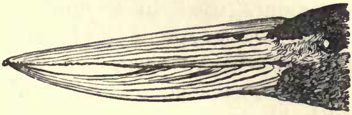
OLIVE, a local name of the OYSTER-CATCHER, and apparently a corruption of OLAF, which is said also to be used (Christy, *B. Essex*, p. 238), and if so the word should be more properly spelt Olave, that being the English form of the sainted Danish king's name. (*Cf.* KNOT, said to be from Cnut.)

OLPH (see ALP and NOPE), with the prefix "Blood" a local name of the BULLFINCH, with that of "Green" of the GREENFINCH.

OMBRE or OMBRETTE, see HAMMER-HEAD.

O-O (variously spelt), the name given in the Sandwich Islands to birds of the genus *Acrulocercus* (*Mohoa* of some writers), one of the *Meliphagidæ* (HONEY-SUCKER), of which 4 species, inhabiting as many islands, have been described. The yellow axillary tufts of one of them, *A. nobilis*, peculiar to Hawaii, have been greatly sought for the beautiful featherwork of the natives since the Mamo[1] (DREPANIS) became rare.

OPEN-BILL (French *Bec-ouvert*), one of the names[2] given to birds of the genus *Anastomus*, allied if not actually belonging to the *Ciconiidæ* (STORK), but by some[3] regarded as constituting a distinct Family. Two species have long been known—one Indian, parti-coloured, *A. oscitans*, *pondicerianus* or *coromandelianus*; the other African and dark coloured, *A. lamelligerus*, so called from the curious flattening and broadening into shining horny-plates of its feather-shafts, especially on the lower parts. In 1880, Prof. Alphonse Milne-Edwards described the form inhabiting Madagascar as distinct, *A. madagascariensis*. It differs chiefly from the African in its smaller size, and the deeper grooving of the bill.



BILL OF ANASTOMUS. (After Swainson.)

OPISTHOCOMUS, see HOACTZIN.

ORANGE-BIRD, a name in Jamaica for *Spindalis* (properly *Spindasis*) *nigricephala*, wrongly identified by Gosse (*B. Jam.* p. 231) with the *Fringilla zena* of Linnæus (which proves to be peculiar to Bahama), one of the TANAGERS, and so-called, says the former, "from the resemblance of its plump and glowing breast to that beautiful fruit." He assigns to it also the name of Cashew-bird; but it is not the CASHEW-BIRD of older authors.

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[1] At pages 166 and 225 this species was mentioned as extinct: an example, however, was obtained in 1892, and its remains are in Mr. Rothschild's collection.

[2] Others, and more recent, are Shell-eater, Shell-Ibis, and Snail-eater, of which the first two are incorrect, and the latter far from distinctive, though these birds feed chiefly on mollusks of the genera *Ampullaria* and *Unio*.

[3] *Cf.* Gurney in Andersson's *B. Damara Land*, p. 283; Oates in Hume's *Nests and Eggs Ind. B.* ed. 2, iii. p. 224.

ORGAN-BIRD, the name in Tasmania for the species of GYMNORHINA there found (Gould, *Handb. B. Austral.* i. p. 178).

ORGANIST, the English rendering of the *Organiste* of Buffon (*Hist. Nat. Ois.* iv. p. 290), though it may be questionable whether all the information he cites really refers to this species, which is the *Pipra musica* of Gmelin, and *Euphonia musica* of modern ornithology, an inhabitant of Hispaniola. Other congeneric species inhabit Jamaica, Porto Rico and some of the Lesser Antilles, though none is found in Cuba, while many more occur from Mexico throughout Central and most parts of South America. Mr. Sclater recognizes 33 species in all (*Cat. B. Br. Mus.* xi. pp. 58-83).

ORIOLE, from the Old French *Oriol* and that from the Latin *aureolus*, the name once applied, from its golden colouring, to the bird generally admitted to be the *Vireo* or ICTERUS (page 457) of classical authors—the *Oriolus galbula* of Linnæus—but now commonly used in a much wider sense. The Golden Oriole, which is the type of the Family *Oriolidæ* of modern ornithologists, is a far from uncommon spring-visitor to the British Islands; but the conspicuous plumage of the male—bright yellow contrasted with black, chiefly on the wings and tail—always attracts attention, and usually brings about its death. Yet a few instances are known in which it is supposed to have bred in England. The nest is a beautifully interwoven fabric, suspended under the horizontal fork of a bough, to both branches of which it is firmly attached, and the eggs are of a shining white sometimes tinged with pink, and sparsely spotted with dark purple. On the Continent it is a well-known though not an abundant bird, and its range in summer extends so far to the east as Irkutsk, while in winter it is found in Natal and Damaraland. In India it is replaced by a closely allied form, *O. kundoo*, chiefly distinguishable by the male possessing a black streak behind as well as in front of the eye; and both in Asia and Africa are several other species more or less resembling *O. galbula*, but some depart considerably from that type, assuming a black head, or even a glowing crimson instead of the ordinary yellow colouring, while others again remain constant to the dingy type of plumage which characterizes the female of the more normal form. Among these last are the aberrant species of the group *Mimetes* or *Mimeta*, belonging to the Australian Region, respecting which Mr. Wallace pointed out the very curious facts—as yet only explicable on the theory of "unconscious MIMICRY"—of which mention has already been made (pages 573, 574). The external similarity of the *Mimeta* and the *Philemon* or *Tropidorhynchus* (FRIAR-BIRD) of the island of Bouru is perfectly wonderful, and has again and again deceived some of the best ornithologists, though the birds are structurally far apart. Another genus which has been referred to the *Oriolidæ*, and may here be mentioned, is *Sphecotheres*, peculiar to the Australian Region, and distinguishable from the more normal Orioles by a bare space round the eye.

The Baltimore Oriole, Orchard Oriole, and other North-American birds to which the name has been applied, belong to the wholly distinct Family *Icteridæ* (ICTERUS).

ORNITHICHNITES, a word compounded from the Greek by Hitchcock in 1832 (*Am. Journ. Sc.* xxix. p. 315) to signify the fossil footprints of Birds, and hence taken as the generic name of the animals which had left those marks, but are now generally believed to have been Dinosaurs (FOSSIL BIRDS, page 277).

ORNITHOLITE, a stone containing the remains or impression of the remains of a Bird.

ORNITHOLOGY, from the Greek ὀρνιθ-, crude form of ὄρνις, a bird (cognate with Scandin. *Ørn* and A.S. *Earn*, whence our ERNE), and λογία, allied to λόγος, commonly Englished a discourse. The earliest use of the word thus spelt seems to be in the third edition of Blount's *Glossographia* (1670), where it is explained as "the speaking of birds: the title of a late Book"[1] (*cf.* Skeat, *Etymol. Dict.* p. 407).

ORNITHOTOMY, the dissection of Birds, and hence the science thereon founded.

ORTHONYX, the scientific name given in 1820, by Temminck, to a little bird, which, from the straightness of its claws,—a character somewhat exaggerated by him,—its large feet and spiny tail, he judged to be generically distinct from any other form. Concerning its affinities much doubt long prevailed. The typical species, *O. maculatus* or *spinicauda*, is from eastern Australia, where it is said to be very local in its distribution, and strictly terrestrial in its habits. In the course of time two other small birds from New Zealand, where they are known as the "WHITEHEAD" and

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[1] This book was doubtless 'Ornitho-logie, | or | The Speech of | Birds. | London, | Printed for *John Stafford*, and are to | be sold at his House, at the *George* at | *Fleet-bridge*. 1655.' The authorship of the book, of which there are several later editions, is ascribed by Lowndes (p. 848) to Thomas Fuller; but whether he was the celebrated writer of that name is doubtful. Mr. J. E. Bailey in his *Life* of that worthy (London: 1874, pp. 761, 762) includes it among his "spurious works," though a later biographer, Mr. Morris Fuller (London: 1884, ii. p. 525) accepts it as genuine. Whoever may have been the author, the word "Ornithologie" is used in a sense very different from the meaning applied to it a few years after, for this treatise is a fable, perhaps, like the agnate 'Anthologia' published with it, "Partly Morall, Partly Misticall," and possibly has also a political significance.

"YELLOWHEAD," were referred to the genus, under the names of *O. albicilla*[1] and *O. ochrocephala*, and then the question of its affinity became more interesting. By some systematists it was supposed to belong to the otherwise purely Neotropical *Dendrocolaptidæ* (PICUCULE), and in that case would have been the sole representative of the Tracheophone *Passeres* in the Australian Region. Others considered it one of the nearest relatives of *Menura*, and if that view had been correct it would have added a third form to the small section of "PSEUDOSCINES"; while Sundevall, in 1872, placed it not far from *Timelia*, among a group the proper sorting of which will probably for years tax the ingenuity of ornithologists.[2] The late Mr. W. A. Forbes shewed (*Proc. Zool. Soc.* 1882, p. 544) that this last position was the more correct, as *Orthonyx* proved on dissection to be one of the true *Oscines*, but yet to stand, so far as is known, alone among birds of that group, or any other group of *Passeres*, in consequence of the superficial course taken by the (left) carotid artery, which is nowhere contained in the subvertebral canal. Whether this discovery will require the segregation of the genus as the representative of a separate Family *Orthonycidæ*——which has been proposed by Mr. Salvin (*Catal. Coll. Strickland*, p. 294)—remains to be seen.[3]

The typical species of Orthonyx—for the scientific name has been adopted in English—is rather larger than a Skylark, coloured above not unlike a Hedge-Sparrow. The wings are, however, barred with white, and the chin, throat and breast are in the male pure white, but of a bright reddish-orange in the female. The remiges are very short, rounded and much incurved, shewing a bird of weak flight. The rectrices are very broad, the shafts stiff, and towards the tip divested of barbs. Two other species that seem rightly to belong to the genus have been described—*O. spaldingi* from Queensland, of much greater size than the type, and with a jet-black plumage, and *O. novæ-guineæ*, from the great island of that name.

ORTOLAN (Old Fr. *Hortolan*, mod. Fr. *Ortolan*), the *Emberiza*

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[1] It may be charitably conjectured that the nomenclator intended to write *albicapilla*.

[2] Dr. Sharpe naturally extended his generous hospitality to *Orthonyx* and placed it in his *Timeliidæ* (*Cat. B. Br. Mus.* vii. p. 329), but refused entrance to *Clitonyx*, which Dr. Gadow had therefore to include (*op. cit.* viii. p. 75) among the *Paridæ*—a wrong position, according to Sir W. Buller.

[3] Forbes also demonstrated that one at least of the two New-Zealand species above mentioned, *O. ochrocephala*, had been wrongly referred to this genus, and they therefore at present stand as *Clitonyx*. This is a point of some little importance in its bearing on the relationship of the fauna of the two countries, for *Orthonyx* was supposed to be one of the few genera of Land-birds common to both.

hortulana of Linnæus, a bird so celebrated for the delicate flavour of its flesh as to have become proverbial, and to have given its name to others, not all of them nearly related, which are supposed to be as well-tasted. A native of most European countries—the British Islands (in which it occurs but rarely) excepted—as well as of western Asia, it emigrates in autumn presumably to the southward of the Mediterranean, though its winter-quarters cannot be said to be accurately known, and returns about the end of April or beginning of May. Its distribution throughout its breeding-range seems to be very local, and for this no reason can be assigned. It was long ago said in France, and apparently with truth, to prefer wine-growing districts; but it certainly does not feed upon grapes, and is found equally in countries where vineyards are unknown—reaching in Scandinavia even beyond the arctic circle—and there it generally frequents corn-fields and their neighbourhood. In appearance and habits it much resembles its congener the YELLOW-HAMMER, but wants the bright colouring of that species, its head for instance being of a greenish-grey instead of a lively yellow. The somewhat monotonous song of the cock is also much of the same kind; and, where the bird is a familiar object to the country people, who usually associate its arrival with the return of fair weather, they commonly apply various syllabic interpretations to its notes, just as our boys do to those of the Yellow-hammer. The nest is placed on or near the ground, but the eggs seldom shew the hair-like markings so characteristic of those of most *Emberizidæ* (BUNTING). Ortolans are netted alive in great numbers, kept from the light of day, and fed with millet, oats and other seeds. In a short time they become enormously fat, and are then killed for the table. If, as is supposed, the Ortolan be the *Miliaria* of Varro, the practice of artificially fattening birds of this species is very ancient.[1]

In Europe the "*Beccafico*" (FIG-EATER), whatever that may be, shares with the Ortolan the highest honours of the dish, but the former is not artificially fattened, and on this account is preferred by some sensitive tastes to the latter.

OSCINES, the third Order of Birds according to the arrangement in 1840 of Keyserling and Blasius (*Wirbelth. Europ.* pp. xxxvi. and 80), consisting of forms which, among other less important characters, are distinguished by the possession of true song-muscles (*cf.* SYRINX and INTRODUCTION).

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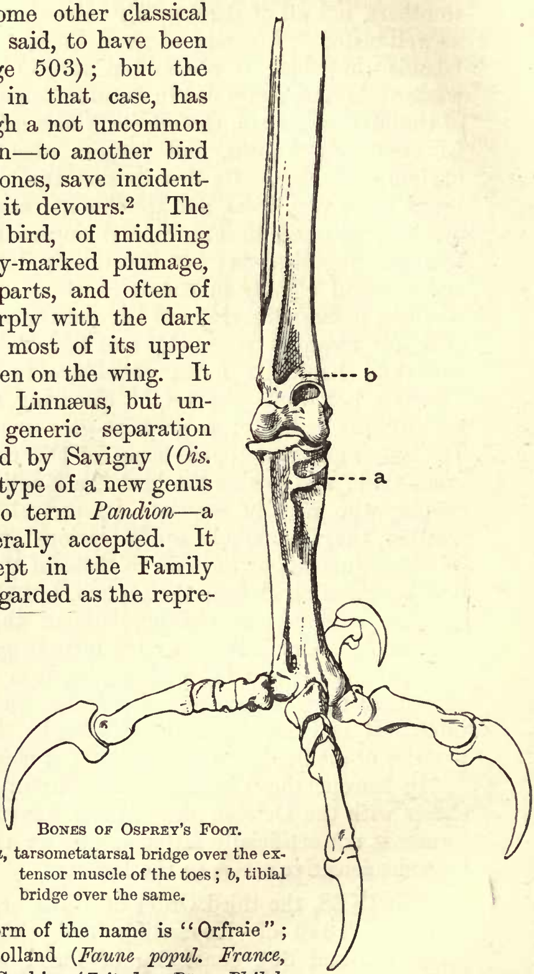
[1] In France the word is used so as to be almost synonymous with our "Bunting"; but in some of the Antilles, where French is spoken, the *Ortolan* is a little Ground-DOVE of the genus *Chamæpelia.* In North America the name is one of the many applied to the BOBOLINK, so justly celebrated for its excellent flavour, as well as to the SORA or Carolina RAIL; while by Anglo-Indians two species of LARK (*Calandrella brachydactyla* and *Pyrrhulauda grisea*) are commonly called Ortolans (Jerdon, *B. Ind.* ii. p. 373).

OSPRAY or OSPREY,[1] a word said to be corrupted from "Ossifrage," in Latin *Ossifraga* or bone-breaker. The *Ossifraga* of Pliny (*Hist. Nat.* x. 3) and some other classical writers seems, as already said, to have been the LÄMMERGEYER (page 503); but the name, not inapplicable in that case, has been transferred—through a not uncommon but inexplicable confusion—to another bird which is no breaker of bones, save incidentally those of the fishes it devours.[2] The Osprey is a rapacious bird, of middling size and of conspicuously-marked plumage, the white of its lower parts, and often of its head, contrasting sharply with the dark brown of the back and most of its upper parts when the bird is seen on the wing. It is the *Falco haliaetus* of Linnæus, but unquestionably deserving generic separation was, in 1810, established by Savigny (*Ois. de l'Égypte*, p. 35) as the type of a new genus which he was pleased to term *Pandion*—a name since pretty generally accepted. It has commonly been kept in the Family *Falconidæ*, but of late regarded as the representative of a separate Family, *Pandionidæ*, for which view not a little can be said.[3] *Pandion* differs from



BONES OF OSPREY'S FOOT.
a, tarsometatarsal bridge over the extensor muscle of the toes; *b*, tibial bridge over the same.

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[1] In the so-called "plume-trade" the word is applied to the feathers taken from the back of certain EGRETS (*cf.* EXTERMINATION, p. 228).

[2] Another supposed old form of the name is "Orfraie"; but that is said by M. Rolland (*Faune popul. France*, ii. p. 9, note) quoting M. Suchier (*Zeitschr. Röm. Philol.* i. p. 432), to arise from a mingling of two wholly different sources:—(1) *Oripelargus*, *Oriperagus*, *Orprais*, and (2) *Ossifraga*. "Orfraie" again is occasionally interchanged with *Effraie* (which, through such dialectical forms as *Fresaie*, *Fressaia*, is said to come from the Latin *præsaga*), the ordinary French name for the Barn-Owl, *Aluco flammeus* (see OWL, *infra*, p. 679, note 2); but the subject is too complex for any but an expert philologist to treat. According to Prof. Skeat (*Etymol. Dict.* p. 408), "Asprey" is the oldest English form; but "Osprey" dates from Cotgrave at least.

[3] Dr. Sharpe goes further, and makes a "Suborder" *Pandiones*; but the

the *Falconidæ* not only pterylologically, as long ago observed by Nitzsch, but also osteologically, as pointed out by M. Alphonse Milne-Edwards (*Ois. Foss. France*, ii. pp. 413, 419), and it is a curious fact that in some of the characters in which it differs structurally from the *Falconidæ*, it agrees with certain of the Owls, especially in possessing a bony bridge or loop (*a*, in fig.) on the upper part of the anterior face of the tarsometatarse, through which passes the common extensor tendon of the toes;[1] and in having the exterior toe partly reversible; but the most important parts of its internal structure, as well as of its ptilosis, quite forbid a belief that there is any near alliance of the two groups.

The Osprey is one of the most cosmopolitan Birds-of-Prey. From Alaska to Brazil, from Lapland to Natal, from Japan to Tasmania, and in some of the islands of the Pacific, it occurs as a winter-visitant or as a native. The countries which it does not frequent would be more easily named than those in which it is found — and among the former are Ireland, Iceland and New Zealand. Though migratory in Europe at least, it is generally independent of climate. It breeds equally on the half-thawed shores of Hudson's Bay and on the cays of Honduras, in the dense forests of Finland and on the barren rocks of the Red Sea, in Kamchatka and in West Australia. Where, through abundance of food, it is numerous—as in former days was the case in the eastern part of the United States—the nests of the Fish-Hawk (to use its American name) may be placed on trees to the number of three hundred close together. Where food is scarcer and the species accordingly less plentiful, a single pair will occupy an isolated rock, and jealously expel all intruders of their kind, as happens in Scotland.[2] The lover of birds cannot see many more enjoyable spectacles than an Osprey engaged in fishing—poising itself aloft, with upright body, and wings beating horizontally, ere it plunges like a plummet beneath the water, and immediately after reappears shaking a shower of drops from its plumage. The feat of carrying off an Osprey's eggs is often difficult, and attended with some risk, but has more than once tempted the most daring of birds' nesters. Apart from the dangerous situation not unfrequently chosen by the birds for their eyry,—a steep rock in a lonely lake, only to be reached after a long swim through chilly water, or the summit of a

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characters on which he founds such an important division are obviously inadequate. The other genus associated with *Pandion* by him has been shewn by Mr. Gurney (*Ibis*, 1878, p. 455) to be nearly allied to the ordinary Sea-EAGLES (*Haliaetus*), and therefore one of the true *Falconidæ*.

[1] This character is possessed by the group of Owls of the subfamily *Striginæ*, according to the nomenclature of this work, but not by those of the *Alucinæ*.

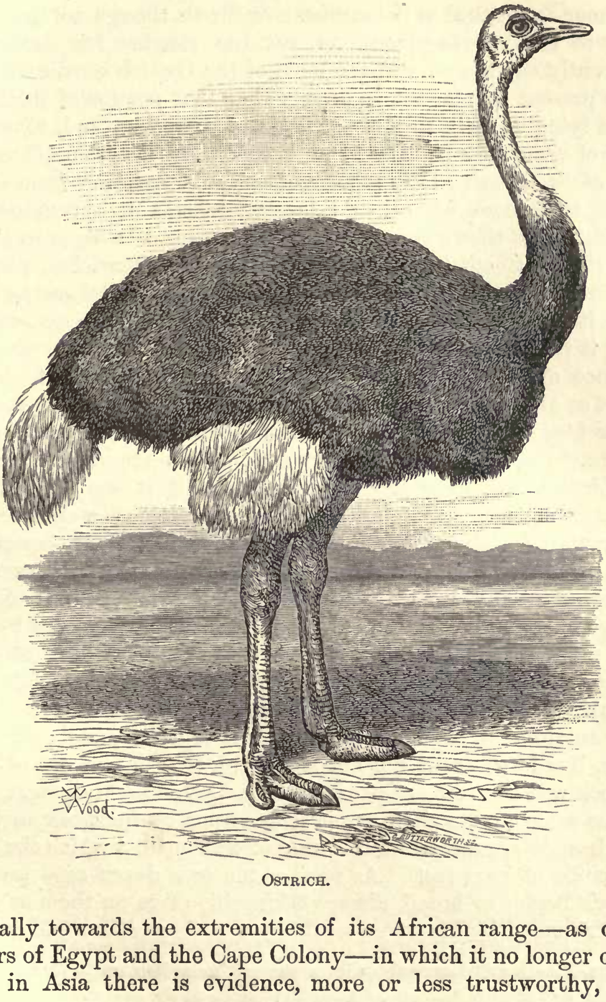
[2] Two good examples of the different localities chosen by this bird for its nest are illustrated in *Ootheca Wolleyana*, pls. B. & H.

very tall tree,—their fierceness in defence of their eggs and young is not to be despised. Men and boys have had their head gashed by the sharp claw of the angry parent, and this, happening when the robber is already in a precarious predicament and unable to use any defensive weapon, renders the enterprise formidable. But the prize is worthy of the danger. Few birds lay eggs so beautiful or so rich in colouring: their white or pale ground is spotted, blotched or marbled with almost every shade of purple, orange and red — passing from the most delicate lilac, buff and peach-blossom, through violet, chestnut and crimson, to a nearly absolute black. A few years ago some of the best-informed ornithologists were led to think that persecution had extirpated the Osprey in Great Britain, except as a chance visitant. This opinion proved to be incorrect, and at the present time the bird is believed still to breed in at least two counties of Scotland, but the secret of its resorts should be carefully guarded by those who wish to retain it as a member of the country's fauna, for indiscreet publication would endanger its occupancy.

OSSIFRAGE, see OSPREY.

OSTRICH (Old English, *Estridge*; French, *Autruche*; Spanish, *Avestruz*; Latin, *Avis struthio*). Among exotic birds there can be hardly one better known by report than the strange, majestic and fleet-footed creature that "scorneth the horse and his rider," or one that from the earliest times to the present has been oftener more or less fully described; and there must be few persons in any civilized country unacquainted with the appearance of this, the largest of living birds, whose size is not insignificant in comparison even with the mightiest of the plumed giants that of old existed upon the earth, since an adult male will stand nearly 8 feet in height, and weigh 300 pounds.

As to the ways of the Ostrich in a state of nature, not much has been added of late years to the knowledge acquired and imparted by former travellers and naturalists, many of whom enjoyed opportunities that will never again occur of discovering its peculiarities, for even the most favourably-placed of their successors in recent years seem to content themselves with repeating the older observations, and to want either leisure or patience to make additions thereto, their personal acquaintance with the bird not amounting to more than such casual meetings with it as must inevitably fall to the lot of those who traverse its haunts. Thus there are still several dubious points in its natural history. On the other hand we unquestionably know far more than our predecessors respecting its geographical distribution, which has been traced with great minuteness in the *Vögel Ost-Afrikas* of Drs. Finsch and Hartlaub, who have therein given (pp. 597-607) the most comprehensive account of the bird that is to be found in the literature of ornithology.[1] As are many conspicuous forms, the Ostrich is disappearing before the persecution of man, and this fact it is which gives the advantage to older travellers, for there are several districts, some of wide extent, known to have been frequented by the Ostrich within the present century,



OSTRICH.

especially towards the extremities of its African range—as on the borders of Egypt and the Cape Colony—in which it no longer occurs, while in Asia there is evidence, more or less trustworthy, of its former existence in most parts of the south-western desert-tracts, in few of which it is now to be found. Xenophon's notice of its abundance in Assyria (*Anabasis*, i. 5) is well known. It probably still lingers in the wastes of Kirwan in eastern Persia, whence examples may occasionally stray northward to those of Turkestan,[1] even near the Lower Oxus; but the assertion, often repeated, as to its former occurrence in Baloochistan or Sindh, though not incredible, seems to rest on testimony as yet too slender for acceptance. Apparently the most northerly limit of the Ostrich's ordinary range at the present day cannot be further than that portion of the Syrian Desert lying directly to the eastward of Damascus; and, within the limits of what may be called Palestine, Canon Tristram (*Fauna and Flora of Palestine*, p. 139) regards it as but a straggler from central Arabia, though we have little information as to its appearance and distribution in that country. Africa, however, is still, as in ancient days, the continent in which the Ostrich most flourishes, and from the confines of Barbary to those of the European settlements in the south it appears to inhabit every waste sufficiently extensive to afford it the solitude it loves, and in many wide districts, where the influence of the markets of civilization is feebly felt, to be still almost as abundant as ever. Yet even there it has to contend with deadly foes in the many species of wild beasts which frequent the same tracts and prey upon its eggs and young—the latter especially; and Lichtenstein long ago remarked that if it were not for its numerous enemies "the multiplication of Ostriches would be quite unexampled." The account given of the habits of the species by this naturalist, who had excellent opportunities of observing it during his three years' travels in South Africa, is perhaps one of the best we have, and since his narrative[2] has been neglected by most of its more recent historians we may do well by calling attention thereto. Though sometimes assembling in troops of from thirty to fifty, and then generally associating with zebras or with some of the larger antelopes, Ostriches commonly, and especially in the breeding-season, live in companies of not more than four or five, one of which is a cock and the rest are hens. All the latter lay their eggs in one and the same nest, a shallow pit scraped out by their feet, with the earth heaped around to form a kind of wall against which the outermost circle of eggs rest. As soon as ten or a dozen eggs are laid, the cock begins to brood, always taking his place on them at nightfall surrounded by his wives, while by day they relieve one another, more it would seem to guard their common treasure from jackals and small beasts-of-prey than directly to forward the process of hatching, for that is often left wholly to the sun.[1] Some thirty eggs are laid in the nest, and round it are scattered perhaps as many more. These last are said to be broken by the old birds to serve as nourishment for the newly-hatched chicks, whose stomachs cannot bear the hard food on which their parents thrive. The greatest care is taken by them not only to place the nest where it may not be discovered, but to avoid being seen when going to or from it, and their solicitude for their tender young is no less. Andersson in his *Lake N'gami* (pp. 253-269) has given a lively account of the pursuit by himself and Mr. Francis Galton of a brood of Ostriches, in the course of which the father of the family flung himself on the ground and feigned being wounded to distract their attention from his offspring. Though the Ostrich ordinarily inhabits the most arid districts, it needs water to drink; and, moreover, it will frequently bathe, sometimes even, according to Von Heuglin, in the sea.

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[1] A good summary of it is contained in the *Ostriches and Ostrich Farming* of Messrs. De Mosenthal and Harting, from which the accompanying figure is, with permission, taken. Von Heuglin, in his *Ornithologie Nordost-Afrika's* (pp. 925-935), has given more particular details of the Ostrich's distribution in Africa.

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[1] Drs. Finsch and Hartlaub quote a passage from Remusat's *Remarques sur l'extension de l'Empire Chinoise*, stating that in about the seventh century of our era a live "camel-bird" was sent as a present with an embassy from Turkestan to China.

[2] M. H. K. Lichtenstein, *Reise im südlichen Africa*, ii. pp. 42-45 (Berlin: 1812).

The question whether to recognize more than one species of Ostrich, the *Struthio camelus* of Linnæus, has been for some years agitated without leading to a satisfactory solution.[2] It has long been known that, while eggs from North Africa present a perfectly smooth surface, those from South Africa are pitted (see page 190, note 4). It has also been observed that northern birds have the skin of the parts not covered with feathers flesh-coloured, while this skin is bluish in southern birds, and hence the latter have been thought to need specific designation as *S. australis.* More recently examples from the Somali country have been described as forming a distinct species under the name of *S. molybdophanes*,[3] from the leaden colour of their naked parts.

The genus *Struthio* forms the type of one group of the Subclass RATITÆ, which differs so widely from the rest, in points that have been concisely set forth by Prof. Huxley (*Proc. Zool. Soc.* 1867, p. 419), as to justify us in regarding it as an Order, to which the name *Struthiones* may be applied; but that term, as well as

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[1] By those whose experience is derived from the observation of captive Ostriches this fact has been disputed. But, to say nothing of the effects of the enforced monogamy in which such birds live, the difference of the circumstances in which they find themselves, and in particular their removal from the heat-retaining sands of the desert and its burning sunshine, is enough to account for the change of habit. Von Heuglin also (p. 933) is explicit on this point. That hen Ostriches while on duty crouch to avoid detection is only natural, and this habit seems to have led hasty observers to suppose they were really brooding.

[2] Dr. Gadow tells me that the discrepancy of several accounts of the Ostrich's anatomy is such as to suggest the possibility of more than one species.

[3] Apparently first noticed in a Berlin newspaper (*Sonntagsb. d. Norddeutsch. Allgem. Zeitung*) by Dr. Reichenow, 16th Sept. 1883, and later, *Mitth. Orn. Ver. Wien*, 1883, tab., and *Journ. f. Orn.* 1883, p. 399.

Struthionidæ, has been often used in a more general sense by systematists, even to signify the whole of the RATITÆ.[1] The most obvious distinctive character presented by the Ostrich is the presence of two toes only, the third and fourth, on each foot,—a character absolutely peculiar to the genus *Struthio*.[2]

The great mercantile value of Ostrich-feathers, and the increasing difficulty, due to the causes already mentioned, of procuring them from wild birds, has led to the formation in the Cape Colony and elsewhere of numerous "Ostrich-farms," on which these birds are kept in confinement, and at regular times deprived of their plumes. In favourable localities and with judicious management these establishments are understood to yield very considerable profit; while, as the ancient taste for wearing Ostrich-feathers shews no sign of falling off, but seems rather to be growing, it is probable that the practice will yet be largely extended.[3]

OUSEL or OUZEL, Anglo-Saxon *Ósle*, equivalent of the German *Amsel* (a form of the word found in several old English books, and perhaps yet surviving in some parts of the country), apparently the ancient name for what is now more commonly known as the BLACKBIRD, the *Turdus merula* of ornithologists, but at the present day not often applied to that species, though, as will immediately be seen, used in a compound form for two others. The adult male of this beautiful and well-known bird scarcely needs any other description than that of the poet:—

> "The Ousel-cock, so black of hue,
> With orange-tawny bill."
> —*Midsummer Night's Dream*, act iii. sc. 1.

But the female is of an uniform umber-brown above, has the chin, throat and upper part of the breast orange-brown, with a few dark streaks, and the rest of the plumage beneath of a hair-brown. The young of both sexes resemble the mother. The Blackbird is found in every country of Europe, even breeding—though rarely—beyond the arctic circle, and in eastern Asia, as well as in Barbary and the Atlantic islands. Resident in Britain as a species, its numbers yet receive considerable accession of passing visitors in autumn, and in most parts of its range it is very migratory. The song of the cock has a peculiarly liquid tone, which makes it much admired, but it is too discontinuous to rank the bird very high as a musician. The species is very prolific, having sometimes as many as four broods in the course of the spring and summer. The nest, generally placed in a thick bush, is made of coarse roots or grass, strongly put together with earth, and is lined with fine grass. Herein are laid from four to six eggs of a light greenish-blue closely mottled with reddish-brown. Generally vermivorous, the Blackbird will, when pressed for food, eat grains and seeds, while berries and fruits in their season are eagerly sought by it, thus earning the enmity of gardeners. More or less allied to and resembling the Blackbird are many other species which inhabit most parts of the world, excepting the Ethiopian Region, New Zealand and Australia proper, and North America. Some of them have the legs as well as the bill yellow or orange; and, in a few of them, both sexes alike display a uniformly glossy black. The only one that need here be particularized is the RING-OUSEL, *Turdus torquatus*, which is at once distinguishable from the Blackbird by its conspicuous white gorget—whence its name. It has also very different habits, frequenting wild and open tracts of country, shunning woods, groves and plantations, and preferring the shelter of rocks to that of trees. Its distribution is accordingly much more local, and in most parts of England it is only known as a transitory migrant in spring and autumn — from and to its hardly as yet ascertained winter quarters.[1]

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[1] At one time it was not uncommon to include the BUSTARDS among the *Struthionidæ* !

[2] Remains of a true Ostrich have been recognized from the Sivalik formation in India, and the petrified egg of an apparently allied form, *Struthiolithus*, has been found in the south of Russia (see FOSSIL BIRDS, p. 285).

[3] Among the more important treatises on this bird may be mentioned:—E. D'Alton, *Die Skelete der Straussartigen Vögel abgebildet und beschrieben*, folio, Bonn: 1827; P. L. Sclater, "On the Struthious Birds living in the Zoological Society's Menagerie," *Trans. Zool. Soc.* iv. p. 353, containing the finest representation (pl. 67), by Mr. Wolf, ever published of the male *Struthio camelus*; Prof. Mivart, "On the Axial Skeleton of the Ostrich," *op. cit.* viii. p. 385; Prof. Haughton, "On the Muscular Mechanism of the Leg of the Ostrich, *Ann. Nat. Hist.* ser. 3, xv. pp. 262-272—a subject more fully treated by M. Alix in his *Essai sur l'appareil locomoteur des Oiseaux* (Paris: 1874); and Prof. Macalister, "On the Anatomy of the Ostrich," *Proc. R. Irish Acad.* ix. pp. 1-24.

The WATER-OUSEL, or Water-Crow—now commonly named the "DIPPER"—is the *Cinclus aquaticus* of most ornithologists, and the type of a small but remarkable group of birds, the position of which many taxonomers have been at their wits' end to determine. It would be useless here to recount the various suppositions that have been expressed; suffice it to say that most ornithologists are now agreed in regarding the genus *Cinclus*[2] as differing so much from other birds that, though essentially one of the true PASSERES (*i.e.* OSCINES), it forms a distinct Family, *Cinclidæ*, which has no very near allies. That some of its peculiarities (for instance, the sternum in adult examples having the posterior margin generally entire, and the close covering of down that clothes the whole body —a character fully recognized by Nitzsch) are correlated with its aquatic habit is probably not to be questioned; but this fact furnishes no argument for associating it, as has often been done, with the *Turdidæ* (THRUSH), the *Troglodytidæ* (WREN), or much less with other groups to which it has undoubtedly no affinity. The Dipper haunts rocky streams, into which it boldly enters, generally by deliberately wading, and then by the strenuous combined action of its wings and feet makes its way along the bottom in quest of its living prey—freshwater mollusks, and aquatic insects in their larval, pupal or mature condition. By the careless and ignorant it is accused of feeding on the spawn of fishes, and it has been on that account subjected to much persecution. Innumerable examinations of the contents of its stomach have not only proved that the charge is baseless, but that the bird clears off many of the worst enemies of the precious product. Short and squat of stature, active and restless in its movements, silky black above, with a pure white throat and upper part of the breast, to which succeeds a broad band of dark bay, it is a familiar figure to most fishermen on the streams it frequents, while the cheerful song of the cock, often heard in the hardest frost, helps to make it a favourite with them in spite of the obloquy under which it labours. The Water-Ousel's nest is a very curious structure,—outwardly resembling a Wren's, but built on a wholly different principle,—an ordinary cup-shaped nest of grass lined with dead leaves, placed in some convenient niche, but encased with moss so as to form a large mass that covers it completely except only a small hole for the bird's passage. The eggs laid within are from four to six in number, and are of a pure white. These remarks refer to the Water-Ousel of central and western Europe, including the British Islands; but, except as regards plumage, it is be-

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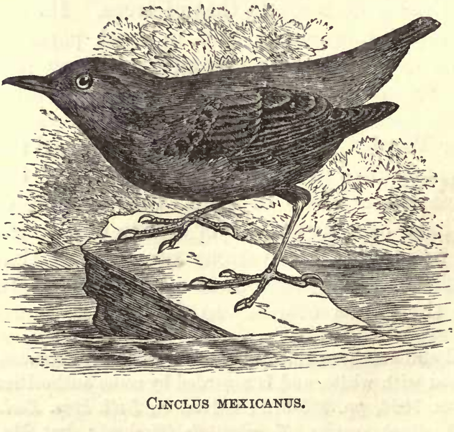
[1] The Ring-Ousel of central and southern Europe presents several differences, having most of its feathers edged with white, and is regarded by some authorities (Stejneger, *Proc. U.S. Nat. Mus.* 1886, pp. 365-372; Salvadori, *Boll. Mus. Zool. Torino*, viii. No. 152) as a distinct species, *T. alpestris* (Brehm); but Mr. Seebohm says (*Ibis*, 1888, pp. 310, 311) that intermediate forms occur, and that further to the eastward, as in Caucasia and Persia, examples shew a still greater divergence, forming a local race to which he applies the name *orientalis*.

[2] Some writers have used for this genus the name *Hydrobata*.

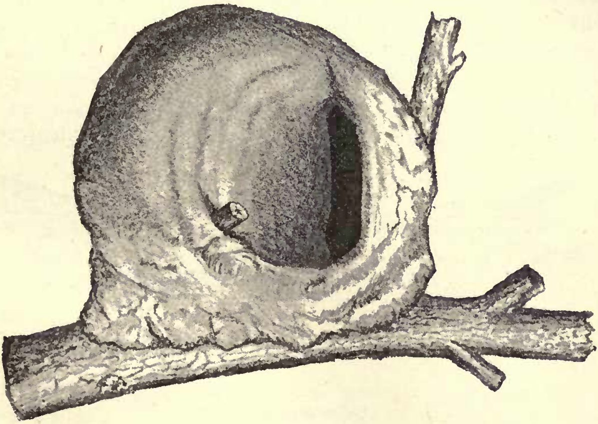


CINCLUS MEXICANUS.

lieved that they will apply to all the other species, about a dozen in number, which have been described. These inhabit suitable places throughout the whole Palæarctic area as well as the southern slopes of the Himalaya and the hill-country of Formosa, besides the Rocky Mountains and a great part of the Andes. Mr. Salvin, in a very philosophical paper on the genus (*Ibis*, 1867, pp. 109-122), refers these species—some of them wholly black and one slate-coloured—to five well-marked forms, of which the other members are either "representative species" or merely "local races"; but all seem to occupy distinct geographical areas,—the *C. mexicanus* represented in the accompanying figure having a wide range along the mountainous parts of North America to Mexico; and it is quite possible that their number may yet be increased, for the general habits of the birds preclude much invasion of territory, and thus produce practical isolation.

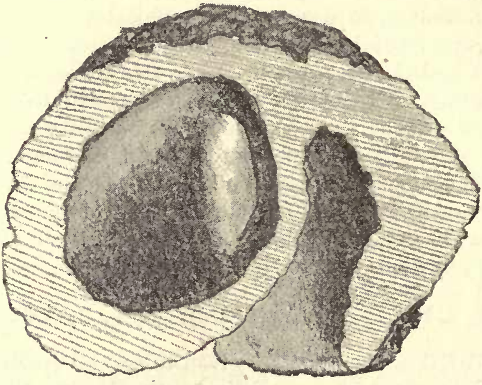
OVARY, OVIDUCT, see REPRODUCTIVE ORGANS.

OVEN-BIRD, a name locally given to several species that build domed nests in England, especially to the Willow-WREN, and in North America to *Siurus auricapillus*, otherwise known as the Golden-crowned Thrush; but by most ornithologists applied to birds of the genus *Furnarius*, belonging to the Neotropical Family *Dendrocolaptidæ* (PICUCULE), the best known of which is *F. rufus*, the Hornero (Baker) or Casera of the Spanish-speaking population.

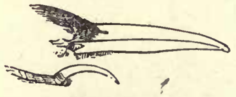


NEST OF OVEN-BIRD (*Furnarius*).
(From specimen given to the Cambridge Museum by Mr. J. Young.)

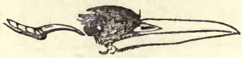
It seeks no concealment, for its wonderful nest[1] is placed in the most conspicuous situations, on the top of a post, a bare rock or a leafless branch, being a massive structure with strong thick walls, composed of mud mixed with bits of straw or fibres, roughly globular in form with an upright opening in front whence a partition extends nearly to the back, forming an ante-chamber to the portion which contains the 4 or 5 white eggs, laid on a bed of soft dry grass. The habits of this species have been mentioned by Mr. Darwin (*Nat. Voy.* chap. v.) and described at some length by Mr. Hudson (*Argent. Orn.* i. pp. 167-170), beside Durnford (*Ibis*, 1877, p. 179) and Mr. E. Gibson (*op. cit.* 1880, pp. 16-18), to say nothing of Burmeister (*Syst. Uebers. Th. Brasil. Vögel*, iii. pp. 3, 4) and Dorbigny (*Voy. Amér. Mérid. Ois.* p. 250).



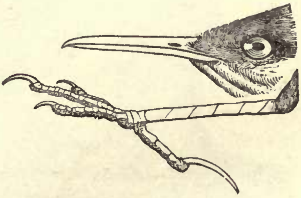
SECTION OF OVEN-BIRD'S NEST.



FURNARIUS.



GEOBATES.



GEOSITTA.

(After Swainson.)

Allied to *Furnarius* are the genera *Geobates* and *Geositta*, of which last one species, *G. cunicularia*, with many of the habits of a WHEATEAR, bores a hole from 3 to 6 feet long in a bank or the side of a biscacha's burrow, placing its nest at the end; but *Geobates*, which is peculiar to the grassy plains (*campos*) of South-eastern Brazil, has much the habits of a LARK or PIPIT, together with the elongated cubital feathers characteristic of those forms, while another, *Upucerthia*, inhabits the most sterile of the upland deserts. None of these birds is of any particular beauty, but to the ornithologist they form a most interesting group, the position of which was for a long while wholly mistaken, and it was only when their anatomical structure came to be known that their place was determined among the TRACHEOPHONÆ.

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[1] Not many figures of this have been given. There is one, such as a child might draw, in Molina's *Compendio* (tav. 2, Bologna: 1776), and that in a *Natural History* (iv. p. 113) edited by Duncan is hardly more instructive: Dr. Göldi's figures (*Zool. Gart.* 1886, pp. 268, 271) are fair.

OWL, the Anglo-Saxon *Úle*, Swedish *Uggla*, and German *Eule*—all allied to the Latin *Ulula*, and evidently of imitative origin—the general English name for every nocturnal Bird-of-Prey,[1] of which group nearly two hundred species have been recognized. The Owls form a very natural assemblage, and one about the limits of which no doubt has for a long while existed. Placed by nearly all systematists for many years as a Family of the Order *Accipitres* (or whatever may have been the equivalent term used by the particular taxonomer), there has been of late a disposition to regard them as forming a group of higher rank. On many accounts it is plain that they differ from the ordinary diurnal Birds-of-Prey, more than the latter do among themselves; and, though in some respects Owls have a superficial likeness to the NIGHTJARS,[2] and a resemblance more deeply seated to the GUACHARO, even the last has not been made out to have any strong affinity to them. A good deal is therefore to be said for the opinion which would rank the Owls as an independent Order, or at any rate Suborder, *Striges*. Whatever be the position assigned to the group, its subdivision has always been a fruitful matter of discussion, owing to the great resemblance obtaining among all its members, and the existence of safe characters for its division has only lately been at all generally recognized. By the older naturalists, it is true, Owls were divided, as was first done by Willughby, into two sections—one in which all the species exhibit tufts of feathers on the head, the so-called "ears" or "horns," and the second in which the head is not tufted. The artificial and therefore untrustworthy nature of this distinction was shewn by Isidore Geoffroy-St. Hilaire (*Ann. Sc. Nat.* xxi. pp. 194-203) in 1830; but he did not do much good in the arrangement of the Owls which he then proposed; and it was hardly until the publication, ten years later, of Nitzsch's *Pterylographie* that rational grounds on which to base a division of the Owls were adduced. It then became manifest that two very distinct types of pterylosis existed in the group, and further it appeared that certain differences, already partly shewn by Berthold (*Beitr. Anat.* pp. 166, 167), of sternal structure coincided with the pterylological distinctions. By degrees other significant differences were pointed out, till, as summed up by Prof. Alphonse Milne-Edwards (*Ois. foss. de la France*, ii. pp. 474-492), there could no longer be any doubt that the bird known in England as the Screech-Owl or Barn-Owl,[1] with its allies, formed a section which should be most justifiably separated from all the others of the group then known. Space is here wanting to state particularly the pterylological distinctions which will be found described at length in Nitzsch's classical work (Eng. trans. pp. 70, 71), and even the chief osteological distinctions must be only briefly mentioned.[2] These consist in the Screech-Owl section wanting any manubrial process in front of the sternum, which has its broad keel joined to the clavicles united as a furcula, while posteriorly it presents an unbroken outline. In the other section, of which the bird known in England as the Tawny or Brown Owl is the type, there is a manubrial process; the furcula, far from being joined to the keel of the sternum, often consists but of two stylets which do not even meet one another; and the posterior margin of the sternum presents two pairs of projections, one pair on each side, with corresponding fissures between them. Furthermore the Owls of the same section shew another peculiarity in the bone usually called the tarsus. This is a bony ring or loop bridging the channel holding the common extensor tendon of the toes—which, as already noticed, is possessed by the OSPREY, but does not appear in the Screech-Owl section any more than in the majority of birds. The subsequent examination by M. Milne-Edwards (*Nouv. Arch. Mus. Mém.* ser. 2, i. pp. 185-200, pls. 4, 5) of the skeleton of an Owl known as *Phodilus* (more correctly *Photodilus*) *badius*, hitherto attached to the Screech-Owl section, shewed that, though in most of its osteological characters it must be referred to the Tawny-Owl section, in several of the particulars mentioned above it resembles the Screech-Owls, and therefore we are bound to deem it a connecting link between them. The pterylological characters of *Photodilus* seem not to have been fully investigated,[1] but it is found on the one hand to want the singular bony tarsal loop, as well as the manubrial process, while on the other its clavicles are not united into a furcula to meet the keel, and the posterior margin of the sternum has processes and fissures like those of the Tawny-Owl section. *Photodilus* having thus to be removed from the Screech-Owl section, Prof. Milne-Edwards has replaced it by a new form, *Heliodilus*, from Madagascar (*Comptes Rendus*, 1887, p. 1282), described at length by him in M. Grandidier's great work on the natural history of that island (*Oiseaux*, i. pp. 113-118, pls. xxxvi. *a-c*). The unexpected results thus obtained preach caution in regard to the classification of other Owls, and add to the misgivings that every honest ornithologist must feel as to former attempts to methodize the whole group—misgivings that had already arisen from the great diversity of opinion displayed by previous classifiers, hardly two of whom seem able to agree. Moreover, the difficulties which beset the study of the Owls are not limited to their respective relations, but extend to their scientific terminology, which has long been in a state so bewildering that nothing but the strictest adherence to the very letter of the laws of nomenclature, which until lately have been approved in principle by all but an insignificant number of zoologists, can clear up the confusion into which the matter has been thrown by heedless or ignorant writers—some of those who are in general most careful to avoid error being not wholly free from blame in this respect.

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[1] The poverty of the English language—generally so rich in synonyms—is here very remarkable. Though four well-known if not common species of Owls are native to Britain, to say nothing of half a dozen others which occur with greater or less frequency, none of them has ever acquired an absolutely individual name, and various prefixes have to be used to distinguish them. It is almost the same in other countries where English is spoken, though North America has its "Saw-whet" and New Zealand its "Morepork"—each name from the bird's call-note. In Greece and Italy, Germany and France, almost each indigenous species has had its own particular designation in the vulgar tongue. The English Owlet or Howlet is of course a simple diminutive only.

[2] In many parts of England the Nightjar is known as the Churn-Owl or Fern-Owl.

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[1] The Owl, however, which commonly breeds in barns in Sweden and perhaps some other parts of Europe is our Tawny Owl, *Strix stridula*.

[2] A few more distinctive characters are shewn by Mr. Beddard in his paper on the classification of this group (*Ibis*, 1888, pp. 335-344).

A few words are therefore here needed on this most unprofitable subject.[2] Under the generic term *Strix*, Linnæus placed all the Owls known to him; but Brisson most justifiably divided that genus, and in so doing fixed upon *Strix stridula*—the aforesaid Tawny Owl—as its type, while under the name of *Asio* he established a second genus, of which his contemporary's *S. otus*, presently to be mentioned, is the type. Some years later Savigny, who had very peculiar notions on nomenclature, disregarding the act of Brisson, chose to recognize the Linnæan *S. flammea*—the Screech-Owl before spoken of—as the type of the genus *Strix*, which genus he further dissevered, and his example was largely followed until Fleming gave to the Screech-Owl the generic name of *Aluco*,[3] by which it had been known for more than three hundred years, and reserved *Strix* for the Tawny Owl. He thus anticipated Nitzsch, whose editor (Burmeister) was probably unacquainted with this fact when he allowed the name *Hybris* to be conferred on the Screech-Owl. No doubt inconvenience is caused by changing any general practice; but, as will have been seen, the practice was not universal, and such inconvenience as may arise is not chargeable on those who abide by the law, as it is intended in this article to do. The reader is therefore warned that the word *Strix* will be here used in what is believed to be the legitimate way, for the genus containing the *Strix stridula* of Linnæus, while *Aluco* is retained for that including the *S. flammea* of the same naturalist.

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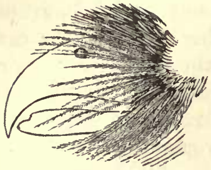
[1] Mr. Beddard has noticed a few points (*Ibis*, 1890, pp. 293-294).

[2] It was dealt with at greater length in *The Ibis* for 1876 (pp. 94-105).

[3] The word seems to have been the invention of Gaza, the translator of Aristotle, in 1503, and is the Latinized form of the Italian *Allocco*.



BILL OF ALUCO FLAMMEUS.
(After Swainson.)

Except the two main divisions just mentioned—*Striginæ* and *Alucinæ*—any further arrangement of the Owls must at present be deemed tentative, for the ordinary external characters, to which most systematists trust, are useless if not misleading.[1] Several systematizers have tried to draw characters from the orifice of the ear, and the parts about it; but hitherto these have not been sufficiently studied to make the attempts very successful. If it be true that the predominant organ in any group of animals furnishes for that group the best distinctive characters, we may have some hope of future attempts in this direction,[2] for we know that few birds have the sense of hearing so highly developed as the Owls, and also that the external ear varies considerably in form in several of the genera which have been examined. Thus in *Surnia*, the Hawk-Owl, and in *Nyctea*, the Snowy Owl, the external ear is simple in form, and, though proportionally larger than in most birds, it possesses no very remarkable peculiarities,—a fact which may be correlated with the diurnal habits of these Owls—natives of the far north, where the summer is a season of constant daylight, and to effect the capture of prey the eyes are perhaps more employed than the ears.[3] In *Bubo*, the Eagle-Owl, though certainly more nocturnal in habit, the external ear, however, has no very remarkable development of conch, which may perhaps be accounted for by the ordinary prey of the bird being the larger rodents, that from their size are more readily seen, and hence the growth of the bird's auditory organs has not been much stimulated. In *Strix* (as the name is here used), a form depending greatly on its sense of hearing for the capture of its prey, the ear-conch is much enlarged, and it has, moreover, an elevated flap or operculum. In *Asio*, containing the Long-eared and Short-eared Owls of Europe, Asia and America, the conch is enormously exaggerated, extending in a semicircular direction from the base of the lower mandible to above the middle of the eye, and is furnished in its whole length with an operculum.[1] But what is more extraordinary in this genus is that the entrance to the ear is asymmetrical—the orifice on one side opening downwards and on the other upwards. This curious adaptation is carried still further in the genus *Nyctala*, containing two or three small species of the Northern hemisphere, in which the asymmetry that in *Asio* is only skin-deep extends, in a manner very surprising, to several of the bones of the head, as may be seen in the Zoological Society's *Proceedings* (1871, pp. 739-743), and in the large series of figures given by Messrs. Baird, Brewer and Ridgway (*N.-Am. Birds*, iii. pp. 97-102).

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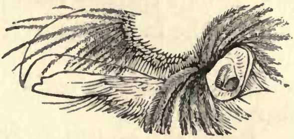
[1] It is much to be regretted that an interesting form of Owl, *Sceloglaux albifacies*, peculiar to New Zealand, the Whekau of the Maories, should be rapidly becoming extinct, without any effort, so far as is known, being made to ascertain its affinities. It would seem to belong to the Strigine section, and is remarkable for its very massive clavicles, that unite by a kind of false joint, which in some examples may possibly be wholly ancylosed, in the median line.

[2] This hope is strengthened by the very praiseworthy essay on the Owls of Norway by Herr Collett in the *Forhandlinger* of Christiania for 1881.

[3] But this hypothesis must not be too strongly urged; for in *Carine*, a more southern form of nocturnal (or at least crepuscular) habits, the external ear is perhaps even more normal. Of course by the ear the real organ of hearing is here meant, not the tuft of feathers often so called in speaking of Owls.



BILL AND EAR OF BUBO.
(After Swainson.)

Among Owls are found birds which vary in length from 5 inches—as *Glaucidium cobanense*, which is therefore much smaller than a Skylark—to more than 2 feet, a size that is attained by many species. Their plumage, none of the feathers of which possesses an aftershaft, is of the softest kind, rendering their flight almost noiseless. But one of the most characteristic features of this whole group is the ruff, consisting of several rows of small and much-curved feathers with stiff shafts—originating from a fold of the skin, which begins on each side of the base of the beak, runs above the eyes, and passing downwards round and behind the ears turns forward, and ends at the chin—and serving to support the longer feathers of the "disk" or space immediately around the eyes, which extend over it. A considerable number of species of Owls, belonging to various genera, and natives of countries most widely separated, are remarkable for exhibiting two phases of coloration—one in which the prevalent browns have a more or less rusty-red tinge, and the other in which they incline to grey. Another characteristic of nearly all Owls is the reversible property of their outer toes, which are not unfrequently turned at the bird's pleasure quite backwards. Many forms have the legs and toes thickly clothed to the very claws; others have the toes, and even the tarsi, bare, or only sparsely beset by bristles. Among the bare-legged Owls those of the Indian genus *Ketupa* are conspicuous, and this feature is usually correlated with their fish-catching habits; but certainly other Owls that are not known to catch fish present much the same character.

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[1] Figures of these different forms are given by Macgillivray (*Brit. Birds*, iii. pp. 396, 403, and 427), and of *Asio otus* in the Fourth Edition of Yarrell's *British Birds* (i. p. 162).

From the multitude of Owls there is only room here to make further mention of a few of the more interesting. First must be noticed the Tawny Owl—the *Strix stridula* of Linnæus, the type, as has been above said, of the whole group, and especially of the Strigine section as here understood. This is the *Syrnium aluco* of many authors, the *Chat-huant* of the French, the species whose tremulous hooting "tu-whit, to-who," has been celebrated by Shakespear, and, as well as the plaintive call, "keewick," of the young after leaving the nest, will be familiar sounds to many readers, for the bird is very generally distributed throughout most parts of Europe, extending its range through Asia Minor to Palestine, and also to Barbary—but not belonging to the Ethiopian Region or to the eastern half of the Palæarctic area. It is the largest of the Owls indigenous to Britain, and chiefly affects woodlands, only occasionally choosing any other place for its nest than a hollow tree. Its food consists almost entirely of small mammals, especially rats; but, though on this account most deserving of protection from all classes, it is subject to the stupid persecution of the ignorant, and is rapidly declining in numbers.[1] Its nearest allies in North America are the *S. nebulosa*, with some kindred forms, one of which, the *S. occidentalis* of California and Arizona, is here figured; but none of them seems to have the "merry note" that is uttered by the European species. Common to the most northerly forest-tracts of both continents (for, though a slight difference of coloration is observable between American examples and those from the Old World, it is impossible to consider it specific) is the much larger *S. cinerea* or *S. lapponica*, whose small eyes, with their yellow iris, iron-grey plumage, delicately mottled with dark brown, and the concentric circles of its facial disks make it one of the most remarkable of the group. Then may be noticed the genus *Bubo*—containing several species which from their size are usually known as Eagle-Owls. Here the Nearctic and Palæarctic forms are sufficiently distinct—

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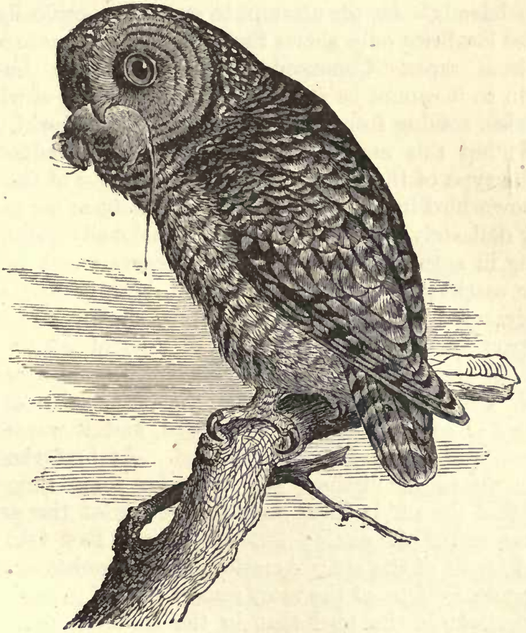
[1] All Owls have the habit of casting up the indigestible parts of the food swallowed in the form of pellets, which may often be found in abundance under the Owl-roost, and reveal without any manner of doubt what the prey of the bird has been. The result in nearly every case shews the enormous service they render to man in destroying rats and mice. Details of many observations to this effect are recorded in the *Bericht über die XIV. Versammlung der Deutschen Ornithologen-Gesellschaft* (pp. 30-34).

the latter, *B. ignavus*,[1] the *Duc* or *Grand Duc* of the French, ranging over the whole of Europe and Asia north of the Himalayas, while the former, *B. virginianus*, extends over the whole of North America. A contrast to the generally sombre colour of these birds is shewn by the Snowy Owl, *Nyctea scandiaca*, a circumpolar species, and the only one of its genus, which disdains the shelter of forests and braves the most rigorous arctic climate, though compelled to migrate southward in winter when no sustenance is left for it. Its large size and white plumage, more or less mottled with black, distinguish this from every other Owl. Then may be mentioned the birds commonly known in English as "Horned" Owls—the *Hibous* of the French, belonging to the genus *Asio*. One, *A. otus* (the *Otus vulgaris* of some authors), inhabits woods, and, distinguished by its long tufts, usually borne erected, would seem to be common to both America and Europe—though experts profess their ability to distinguish between examples from each country. Another species, *A.*



STRIX OCCIDENTALIS.

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[1] This species bears confinement very well, and propagates freely therein. The Owls so well known as formerly kept at Arundel Castle were always referred to it, until Mr. Borrer (*B. Sussex*, Introd. p. xvii.) shewed that they belonged to the kindred *B. virginianus*.

accipitrinus (the *Otus brachyotus* of many authors), has much shorter tufts on its head, and they are frequently carried depressed so as to escape observation. This is the "Woodcock-Owl" of English sportsmen, for, though a good many are bred in Great Britain, the majority arrive in autumn from Scandinavia, just about the time that the immigration of Woodcocks occurs. This species frequents heaths, moors, and the open country generally, to the exclusion of woods, and has an enormous geographical range, including not only all Europe, North Africa, and northern Asia, but the whole of America,—reaching also to the Falklands, the Galapagos and the Sandwich Islands,—for the attempt to separate specifically examples from those localities only shews that they possess more or less ill-defined local races. Commonly placed near *Asio*, but whether really akin to it cannot be stated, is the genus *Scops*, of which nearly forty species, coming from different parts of the world, have been described; but this number should probably be reduced by one half. The type of the genus, *S. giu*, the *Petit Duc* of the French, is a well-known bird in the south of Europe, about as big as a Thrush, with very delicately-pencilled plumage, occasionally visiting Britain, emigrating in autumn across the Mediterranean, and ranging very far to the eastward. Further southward, both in Asia and Africa, it is represented by other species of very similar size, and in the eastern part of North America by *S. asio*, of which there is a tolerably distinct western form, *S. kennicotti*, besides several local races. *S. asio* is one of the Owls that especially exhibits the dimorphism of coloration above mentioned, and it was long before the true state of the case was understood. At first the two forms were thought to be distinct, and then for some time the belief obtained that the ruddy birds were the young of the greyer form which was called *S. nævia*; but now the "Red Owl" and the "Mottled Owl" of the older American ornithologists are known to be one species.[1] One of the most remarkable of American Owls is *Speotyto cunicularia*, the bird that in the northern part of the continent inhabits the burrows of the prairie-dog, and in the southern those of the biscacha, where the latter occurs—making holes for itself, says Darwin, where that is not the case,—rattlesnakes being often also joint tenants of the same abodes. The odd association of these animals, interesting as it is, cannot here be more than noticed, for a few words must be said, ere we leave the Owls of this section, on the species which has associations of a very different kind—the bird of Pallas Athene, the emblem of the city to which science and art were so welcome. There can be no doubt, from the many representations on coins and sculptures, as to their subject being the *Carine noctua* of modern ornithologists, but those who know the grotesque actions and ludicrous expression of this veritable buffoon of birds can never cease to wonder at its having been seriously selected as the symbol of learning, and can hardly divest themselves of a suspicion that the choice must have been made in the spirit of sarcasm. This Little Owl (for that is its only English name—though it is not even the smallest that appears in England), the *Chevêche* of the French, is spread throughout the greater part of Europe, but it is not a native of Britain.[1] It has a congener in *C. brama*, a bird well known to all residents in India.

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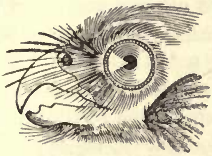
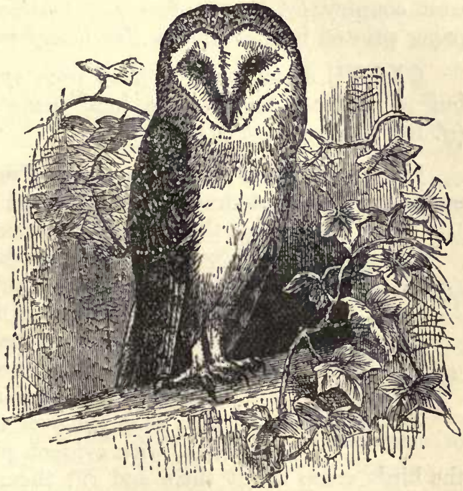
[1] See the remarks of Mr. Ridgway in the work before quoted (*B. N. America*, iii. pp. 9, 10), where also response is made to the observations of Mr. Allen in the Harvard *Bulletin* (ii. pp. 338, 339), as well as the former's elaborate review of the American species of the genus (*Proc. U.S. Nat. Mus.* i. pp. 85-117.)


Head of Carine.
(After Swainson.)

Finally, we have Owls of the second section, those allied to the Screech-Owl, *Aluco flammeus*, the *Effraie*[2] of the French. This, with its discordant scream, its snoring, and its hissing, is far too well known to need description, for it is one of the most widely-spread of birds, and is the Owl that has the greatest geographical range, inhabiting almost every country in the world,—Sweden and Norway, America north of lat. 45°, and New Zealand being the principal exceptions. It varies, however, not inconsiderably, both in size and intensity of colour, and several ornithologists have tried to found on these variations more than half a dozen distinct species. Some, if not most of them, seem, however, hardly worthy to be considered geographical races, for their differences do not always depend on locality. Dr. Sharpe, with much labour and


Aluco flammeus. (After Wolf.)

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[1] A very large number have first and last been liberated in this country by Lord Lilford and Mr. Meade-Waldo; but though they have been known to breed in their feral state, they can hardly be said to have established themselves.

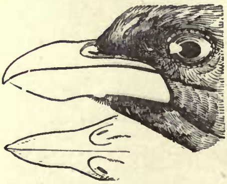
[2] Through the dialectic forms *Fresaie* and *Presaie*, the origin of the word is easily traced to the Latin *præsaga*—a bird of bad omen; but it has also been confounded with *Orfraie*, a name of the Osprey.

in great detail, has given his reasons (*Cat. B. Brit. Mus.* ii. pp. 291-309; and *Ornith. Miscell.* i. pp. 269-298; ii. pp. 1-21) for acknowledging four "subspecies" of *A. flammeus*, as well as five other species. Of these last, *A. tenebricosus* is peculiar to Australia, while *A. novæ-hollandiæ* inhabits also New Guinea, and has a "subspecies," *A. castanops*, found only in Tasmania; a third, *A. candidus*, has a wide range from Fiji and northern Australia through the Philippines and Formosa to China, Burma and India; a fourth, *A. capensis*, is peculiar to South Africa; while *A. thomensis* is said to be confined to the African island of St. Thomas. There is also the extinct *A. sauzieri* of Mauritius (*Trans. Zool. Soc.* xiii. p. 286), and to these will perhaps have to be added a species from New Britain, described by Count T. Salvadori as *Strix aurantia*, though it may prove on further investigation not to be an Alucine Owl at all.

OX-BIRD, a common name for the DUNLIN, and in connexion therewith Mr. Harting, in the Introduction (p. xvii.) to Rodd's *Birds of Cornwall*, reasonably refers OXEN-AND-KINE, by which name some apparently small wildfowl were of old times known in the west country (*cf.* Carew, *Survey of Cornwall*, fol. 35, and a curious paper printed in the *Camden Miscellany*,[1] iv. pp. 10, 26).

OX-EYE seems once to have been synonymous with OX-BIRD, but is now only known as a local name for the Great TITMOUSE (*cf.* Sw. *Talgoxe* = fat ox).[2]

OX-PECKER, a rendering of the French *Pique-bœuf*, bestowed on a small, dull-coloured bird discovered by Adanson in Senegal, the *Buphaga africana* of Linnæus, which has been almost invariably referred to the Family *Sturnidæ* (STARLING), chiefly, it would seem, because it flies in flocks, and settles on the back of cattle in search of the bots or ticks with which they are infested. Though the animals are at first alarmed at the visitation, they soon get over the fright, regarding, it is said, with evident pleasure the way in which the birds creep about them and rid them of the pests. A second



OXPECKER.
(After Swainson.)

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[1] The Editor of this, Mr. W. D. Cooper, suggests that the birds were Ruffs and Reeves, but there is no evidence that those birds were ever to be had in Devon or Cornwall; however, Mr. C. Swainson (*Prov. Names Br. B.* p. 195) accepts the suggestion as if it were a fact. Mr. Sclater (*List Vert. Anim. Gardens of the Zool. Soc.* 1883, p. 246) applies "Ox-bird" to *Textor albirostris* or *alecto*, one of the WEAVER-BIRDS.

[2] A copy of Belon's *Portraits d'Oyseaux* (1557) in the Public Library of the University of Cambridge (M. 15. 43) has the English names of many of the birds written in an ancient hand. To the figure of *Himantopus* (STILT) the name Ox-eye is applied.

species, *B. erythrorhyncha*, with a wholly red instead of a yellow bill was afterwards found in Abyssinia, and thought for some time to be peculiar to the more northern part of Africa, but it is now known to occur so far south as Natal, while the first has been observed in Damaraland and the Transvaal. Very little more seems to be known of the habits of either, and the systematic position of the genus must be held uncertain.

OXYNOTUS, the name of a genus of birds now ascertained to be peculiar to two of the Mascarene Islands—Mauritius and Réunion (Bourbon)—where the name of *Cuisinier* is applied to them, and remarkable for the fact, nearly if not quite unique in Ornithology,[1] that, while the males of both species are almost identical in appearance, the females are wholly unlike each other. Though the habits of the Mauritian species, *O. rufiventer*, have been very fairly observed, there seems to be nothing in them that might account for the peculiarity. The genus *Oxynotus* is generally placed in the group known as *Campephagidæ*, most or all of which are distinguished from the *Laniidæ* (to which they seem nearly allied) by the feathers on the lower part of the back and on the rump having the basal portion of the shaft very stiff and the distal portion soft—a structure which makes that part of the body, on being touched by the finger, feel as though it were beset with blunt prickles. Hence the name of the genus conferred by Swainson, and intended to signify "prickly back." The males, which look rather like miniature Grey Shrikes (*Lanius excubitor* and others), are —except on close examination, when some slight differences of build and shade become discernible—quite indistinguishable; but the female of the one species has a reddish-brown back, and is bright ferruginous beneath, while the female of the other species is dull white beneath, transversely barred, as are the females of some Shrikes, with brown. Both sexes of each species, and the young of one of them, are described and figured in *The Ibis* for 1866 (pp. 275-280, pls. vii. and viii.)

OYSTER-CATCHER, a bird's name which does not seem to occur in books until 1731, when Catesby (*Nat. Hist. Carolina*, i. p. 85) used it for a species which he observed to be abundant on the oyster-banks left bare at low water in the rivers of Carolina, and believed to feed principally upon those mollusks. In 1773 Pennant applied the name generically, though he and for nearly two hundred years other British writers had called the allied British species the "Sea-Pie." The change, in spite of the misnomer—for, whatever may be the case elsewhere, in England the bird does not feed upon oysters—met with general approval, and the new name has, at least in books, almost wholly replaced what seems to have been the older one.[1] The Oyster-catcher of Europe is the *Hæmatopus*[2] *ostralegus* of Linnæus, belonging to the group now called *Limicolæ*, and is generally included in the Family *Charadriidæ*; though some writers have placed it in one of its own, *Hæmatopodidæ*, chiefly on account of its peculiar bill—a long thin wedge, ending in a vertical edge. Its feet also are much more fleshy than are generally seen in the Plover Family. In its strongly-contrasted plumage of black and white, with a coral-coloured bill, the Oyster-catcher is one of the most conspicuous birds of the European coasts, and in many parts is still very common. It is nearly always seen paired, though the pairs collect in prodigious flocks; and, when these are broken up, its shrill but musical cry of "tu-lup," "tu-lup," somewhat pettishly repeated, helps to draw attention to it. Its wariness, however, is very marvellous, and even at the breeding-season, when most birds throw off their shyness, it is not easily approached within ordinary gunshot distance. The hen-bird commonly lays three clay-coloured eggs, blotched with black, in a very slight hollow on the ground, not far from the sea. As incubation goes on the hollow is somewhat deepened, and perhaps some haulm is added to its edge, so that at last a very fair nest is the result. The young, as in all *Limicolæ*, are at first clothed in down, so mottled in colour as closely to resemble the shingle to which, if they be not hatched upon it, they are almost immediately taken by their parents, and there, on the slightest alarm, they squat close to elude observation. This species occurs on the British coasts (very seldom shewing itself inland) all the year round; but there is some reason to think that those we have in winter are natives of more northern latitudes, while our home-bred birds leave us. It ranges from Iceland to the shores of the Red Sea, and lives chiefly on marine worms, crustacea, and such mollusks as it is able to obtain. It is commonly supposed to be capable of prizing limpets from their rock, and of opening the shells of mussels; but, though undoubtedly it feeds on both, further evidence as to the way in which it procures them is desirable. Mr. Harting informs us that the bird seems to lay its head sideways on the ground, and then, grasping the limpet's shell close to the rock between the mandibles, use them as scissor-blades to cut off the mollusk from its sticking-place. The Oyster-catcher is not highly esteemed as a bird for the table.

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[1] The only other instance cited by Darwin (*Descent of Man*, ii. pp. 192, 193) is that of two species of *Paradisea*; but therein the males differ from one another to a far greater degree than do those of *Oxynotus*.

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[1] It seems however very possible, judging from its equivalents in other European languages, such as the Frisian *Oestervisscher*, the German *Austermann*, *Austernfischer*, and the like, that the name "Oyster-catcher" may have been not a colonial invention but indigenous to the mother-country, though it had not found its way into print before. The French *Huîtrier*, however, appears to be a word coined by Brisson. "Sea-Pie" has its analogues in the French *Pie-de-Mer*, the German *Meerelster*, *Seeelster*, and so forth.

[2] Whether it be the *Hæmatopus* whose name is found in some editions of Pliny (lib. x. cap. 47) is at best doubtful. Other editions have *Himantopus*; but Hardouin prefers the former reading. Both words have passed into modern ornithology, the latter as the generic name of the STILT; and some writers have blended the two in the strange and impossible compound *Hæmantopus*.

Differing from this species in the possession of a longer bill, in having much less white on its back, in the paler colour of its mantle, and in a few other points, is the ordinary American species, already mentioned, *H. palliatus.* Except that its call-note, judging from description, is unlike that of the European bird, the habits of the two seem to be perfectly similar; and the same may be said indeed of all the other species. The Falkland Islands are frequented by a third, *H. leucopus,* very similar to the first, but with a black wing-lining and paler legs, and Mr. Ridgway (*Auk,* 1886, p. 331) thinks the Galapagos have a distinct species, *H. galapagensis,* while the Australian Region possesses another, *H. longirostris,* with a very long bill as its name intimates, and no white on its primaries. China, Japan and possibly eastern Asia in general have an Oyster-catcher which seems to be intermediate between the last and the first. This has received the name of *H. osculans*; but doubts have been expressed as to its deserving specific recognition. Then we have a group of species in which the plumage is wholly or almost wholly black, and among them only do we find birds that fulfil the implication of the scientific name of the genus by having feet that may be called blood-red. *H. niger,* which frequents both coasts of the northern Pacific, has, it is true, yellow legs, but towards the extremity of South America its place is taken by *H. ater,* in which they are bright red, and this bird is further remarkable for its laterally compressed and much upturned bill. The South-African *H. capensis* has also scarlet legs; but in the otherwise very similar bird of Australia and New Zealand, *H. unicolor,* these members are of a pale brick-colour.

P

PAAUW (Peafowl), the Dutch name applied generally in South Africa to some of the BUSTARDS.

PADDA, see JAVA SPARROW.

PADDY-BIRD, the Anglo-Indian name for any of the smaller EGRETS, from their frequenting the rice-fields (*padda*).

PALAMEDEA, see SCREAMER.

PALATE, the roof of the mouth, whence PALATAL (commonly Palatine) Bones, being the pair of bones which connect the MAXILLA with the PTERYGOIDS, and rest by articulating facets on the ventral side of the sphenoidal rostrum of the SKULL. They have considerable taxonomic importance.

PAMPRODACTYLÆ, Dr. Murie's name (*Ibis*, 1873, p. 190, note) for the group consisting of the *Coliidæ* (MOUSE-BIRD).

PANCREAS, a conglomeration of glands, forming one or more lobes, and placed between the two branches of the duodenal loop (DIGESTIVE SYSTEM, pages 141-143). Its secretion, the Pancreatic Juice, contains a ferment important for digestion and enters the duodenum through from one to three short ducts, which in most birds open into its ascending branch between the hepato-enteric and cystico-enteric ducts. The size and position of the Pancreas are very variable and of little general interest.

PARADISE-BIRD, see BIRD-OF-PARADISE; -DUCK, see SHELDDRAKE.

PARAKEET, variously spelt, see PARROT.

PARAPTERON, Sundevall's name for the row or rows of feathers commonly known as upper wing-coverts.

PARDALOTE, see DIAMOND-BIRD.

PARRA, see JACANA.

PARROT, according to Prof. Skeat (*Etym. Dict.* p. 422), from the French *Perrot* or *Pierrot*, a proper name and the diminutive of *Pierre*,[1] the name given generally to a large and very natural group of Birds, which for more than a score of centuries have attracted attention, not only from their gaudy plumage, but, at first and chiefly it would seem, from the readiness with which many of them learn to imitate the sounds they hear, repeating the words and even phrases of human speech with a fidelity that is often astonishing. It is said that no representation of any Parrot appears in Egyptian art, nor does any reference to a bird of the kind occur in the Bible, whence it has been concluded that neither the painters nor the writers concerned had any knowledge of it. Aristotle is commonly supposed to be the first author who mentions a Parrot; but this is an error, for nearly a century earlier Ctesias in his *Indica* (cap. 3),[1] under the name of *βίττακος* (*Bittacus*), so neatly described a bird which could speak an "Indian" language—naturally, as he seems to have thought—or Greek—if it had been taught so to do,—about as big as a Sparrow-Hawk (*Hierax*), with a purple face and a black beard, otherwise blue-green (*cyaneus*) and vermilion in colour, so that there cannot be much risk in declaring that he must have had before him a male example of what is now commonly known as the Blossom-headed Parakeet, and to ornithologists as *Palæornis cyanocephalus*, an inhabitant of many parts of India. Much ingenuity has been exercised in the endeavour to find the word whence this, and the later form of the Greek name, was derived, but to little or no purpose. After Ctesias comes Aristotle's *ψιττάκη* (*Psittace*), which Sundevall supposes him to have described only from hearsay; but this matters little, for there can be no doubt that the Indian conquests of Alexander were the means of making the Parrot better known in Europe, and it is in reference to this fact that another Eastern species of *Palæornis* now bears the name of *P. alexandri*, though from the localities it inhabits it could not have had anything to do with the Macedonian king. That Africa had Parrots does not seem to have been discovered by the ancients till long after, as Pliny tells us (vi. 29) that they were first met with by explorers employed by Nero beyond the limits of Upper Egypt. These birds, highly prized from the first, reprobated by the moralist, and celebrated by more than one classical poet, as time went on were brought in great numbers to Rome, and ministered in various ways to the luxury of the age. Not only were they lodged in cages of tortoise-shell and ivory, with silver wires, but they were professedly esteemed as delicacies for the table, and one emperor is said to have fed his lions upon them! But there would be little use in dwelling longer on these topics. With the decline of the Roman empire the demand for Parrots in Europe lessened, and so the supply dwindled, yet all knowledge of them was not wholly lost, and they are occasionally mentioned by one writer or another until in the fifteenth century began that career of geographical discovery which has since proceeded uninterruptedly. This immediately brought with it the knowledge of many more forms of these birds than had ever before been seen, for whatever races of men were visited by European navigators—whether in the East Indies or the West, whether in Africa or in the islands of the Pacific—it was almost invariably found that even the most savage tribes had tamed some kind of Parrot; and, moreover, experience soon shewed that no bird was more easily kept alive on board ship and brought home, while, if it had not the merit of "speech," it was almost certain to be of beautiful plumage. Yet so numerous is the group that even now new species of Parrots are not uncommonly recognized, though, looking to the way in which the most secluded parts of the world are being ransacked, we must soon come to an end of this.

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[1] "Parakeet" (in Shakespear, 1 *Hen. IV.* ii. 3, 88, "Paraquito") is said by the same authority to be from the Spanish *Periquito* or *Perroqueto*, a small Parrot, diminutive of *Perico*, a Parrot, which again may be a diminutive from *Pedro*, the proper name. Parakeet (spelt in various ways in English) is usually applied to the smaller kinds of Parrots, especially those which have long tails, not as *Perroquet* in French, which is used as a general term for all Parrots, *Perruche*, or sometimes *Perriche*, being the ordinary name for what we call Parakeet. The old English "POPINJAY" and the old French *Papegaut* have almost passed out of use, but the German *Papagei* and Italian *Papagaio* still continue in vogue. Some trace these names to the Arabic *Babaghá*; but others think that word a corruption of the Spanish *Papagayo*. The Anglo-Saxon name of the Parret, a river in Somerset, is Pedreda or Pedrida, which at first sight looks as if it had to do with the proper name, Petrus; but Prof. Skeat believes there is no connexion between them—the latter portion of the word being *rið*, a stream.

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[1] The passage seems to have escaped the notice of all naturalists until Broderip mentioned it in his article "Psittacidæ" in the *Penny Cyclopædia* (xix. p. 83).

The home of the vast majority of Parrot-forms is unquestionably within the tropics, but the popular belief that Parrots are tropical birds only is a great mistake. In North America the Carolina Parakeet, *Conurus carolinensis*, at the beginning of the present century used to range in summer as high as the shores of Lakes Erie and Ontario—a latitude equal to that of the south of France; and even within the last forty years it reached, according to trustworthy information, the junction of the Ohio and the Mississippi, though now its limits have been so much curtailed that its occurrence in any but the Gulf States is doubtful, and its extirpation as a species seems to be only a question of time.[1] In South America, at least four species of Parrots are found in Chili or La Plata, and one, *Conurus* or *Cyanolyseus patagonus*, is pretty common on the bleak coast of the Strait of Magellan. In Africa, it is true that no species is known to extend to within some ten degrees of the tropic of Cancer; but *Pœocephalus robustus* inhabits territories lying quite as far to the southward of the tropic of Capricorn. In India the northern range of the group is only bounded by the slopes of the Himalaya, and further to the eastward Parrots are not only abundant over the whole of the Malay Archipelago, as well as Australia and Tasmania, but two very well-defined Families are peculiar to New Zealand and its adjacent islands (KAKAPO and NESTOR), while the genus *Platycercus*, or that section of it called *Cyanorhynchus*, has several representatives in the Region last named, one species, *P. erythrotis*, reaching the Macquarrie Islands in lat. 55° S., the highest attained by any of the Order. No Parrot has recently inhabited the Palæarctic area,[2] nor are Parrots represented by many different forms in either the Ethiopian or the Indian Region. In continental Asia the distribution of Parrots is rather remarkable. None extend further to the westward than the valley of the Indus,[3] which, considering the nature of the country in Baloochistan and Affghanistan, is perhaps intelligible enough; but it is not so easy to understand why none are found either in Cochin China or China proper; and they are also wanting in the Philippine Islands, which is the more remarkable and instructive when we find how abundant they are in the groups a little further to the southward. Indeed Mr. Wallace has well remarked that the portion of the earth's surface which contains the largest number of Parrots, in proportion to its area, is undoubtedly that covered by the islands extending from Celebes to the Solomon group. "The area of these islands is probably not one-fifteenth of that of the four tropical regions, yet they contain from one-fifth to one-fourth of all the known Parrots" (*Geogr. Distr. Anim.* ii. p. 330). He goes on to observe also that in this area are found many of the most remarkable forms—all the red Lories, the great black Cockatoos, the pigmy *Nasiternæ*, and other singularities. In South America the species of Parrots, though numerically nearly as abundant, are far less diversified in form, and all of them seem capable of being referred to two or, at most, three sections. The species that has the widest range, and that by far, is the common Ring-necked Parakeet, *Palæornis torquatus*, a well-known cage-bird which is found from the mouth of the Gambia across Africa to the coast of the Red Sea, as well as throughout the whole of India, Ceylon and Burma to Tenasserim.[1] On the other hand there are plenty of cases of Parrots which are restricted to an extremely small area—often an island of insignificant size, as *Conurus pertinax*, confined to the island of St. Thomas in the Antilles, and *Palæornis exsul*, to that of Rodriguez in the Indian Ocean (*Ibis*, 1872, pp. 31-34, 1875, p. 342, pl. vii.)—to say nothing of the remarkable instance afforded by *Nestor productus*[2] (see pp. 223, 224 and 628).

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[1] *Cf. inter alios*, W. W. Cooke, *Rep. Bird Migr. Mississippi*, p. 124 (1888); W. Brewster, *Auk*, 1889, p. 337; A. W. Butler, *op. cit.* 1892, pp. 49-56.

[2] A few remains of a Parrot have been recognized from the Miocene of the Allier in France, by Prof. A. Milne-Edwards (*Ois. Foss. France*, ii. p. 525, pl. cc.), and are said by him to shew the greatest resemblance to the common Grey Parrot of Africa, *Psittacus erithacus*, though having also some affinity to the Ring-necked Parakeet of the same country, *Palæornis torquatus*. He refers them, however, to the same genus as the former, under the name of *Psittacus verreauxi*.

[3] The statements that have been made, and even repeated by writers of authority, as to the occurrence of "a green parrot" in Syria (Chesney, *Exped.*

Survey Euphrates and Tigris, i. pp. 443, 537) and of a Parrot in Turkestan (*Jour. As. Soc. Bengal*, viii. p. 1007) originated with gentlemen who had no ornithological knowledge, and are evidently erroneous. Some species of ROLLER possibly gave rise to the assertions.

[1] It is right to state, however, that the African examples of this bird are said to be distinguishable from the Asiatic by their somewhat shorter wings and weaker bill, and hence they are considered by some authorities to form a distinct species, *P. docilis*; but in thus regarding them the difference of locality seems to have influenced opinion, and without that difference they would scarcely have been separated, for in many other groups of birds distinctions so slight are regarded as barely evidence of local races. Even West-African examples are said by Count T. Salvadori (*Cat. B. Brit. Mus.* xx. p. 448) to have larger bills than those from the eastern side, which have been further distinguished as *P. parvirostris*.

[2] A case very like that of *Nestor productus* (pp. 223, 628) is presented by the "Mascarin" (*Pl. Enl.* 35) a Parrot which formerly inhabited the island of Bourbon (Réunion). The last known living example was in the royal menagerie at Munich and was figured in 1835 by Hahn (*Orn. Atlas, Papegeien*, p. 54, pl. 39);

The systematic treatment of this very natural group has long been a difficult subject, and almost the only approach to unanimity among those who have made it their study, lies in the somewhat general belief which has grown up within the last half of this century that the Parrots should be regarded as forming a distinct Order. A few systematists, among whom Bonaparte was chief, placed them at the top of the Class, conceiving that they were the analogues of the *Primates* among Mammals. Prof. Huxley has recognized the *Psittacomorphæ* as forming one of the principal groups of *Carinatæ*, and, by whatever name we call them, that much seems to be evident. It will here, however, be unnecessary to discuss the rank which the Parrots should hold, and it is quite enough of a task to consider the most natural or—if we cannot hope at present to reach that—at least the most expedient way of subdividing them. It is a reproach to ornithologists that so little satisfactory progress has been made in this direction, and the result is all the more disheartening, seeing that there is no group of exotic birds that affords equal opportunities for anatomical examination, since almost every genus extant, and more than two-thirds of the species, have within recent times been kept in confinement in one or another of our zoological gardens, and at their death have furnished subjects for dissection. Yet the laudable attempt of M. Blanchard (*Compt. Rend.* xliii. 1097-1100 and xliv. 518-521) was not successful, and it cannot be affirmed that the latest arrangement of the *Psittaci* is really much more natural than that planned by Buffon in 1779.[1] He was of course unaware of the existence of some of the most remarkable forms of the group, in particular of *Stringops* and *Nestor*; but he began by making two great divisions of those that he did know, separating the Parrots of the Old World from the Parrots of the New, and subdividing each of these divisions into various sections somewhat in accordance with the names they had received in popular language—a practice he followed on many other occasions, for he seems to have held a belief that there is more truth in the discrimination of the unlearned than the scientific are apt to allow. The end was that he produced a plan which is comparatively simple and certainly practical, while as just stated it cannot be confidently declared to be unnatural. However, not to go very

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but all trace of it has since been lost, and the only two specimens that exist in Museums are at Paris and Vienna respectively—the latter having been obtained on the dispersal of the Leverian Museum in 1806, when it formed lot 5828 in the sale catalogue, and was there said to be from America! (*Cf.* Von Pelzeln, *Ibis*, 1873, p. 32; A. Milne-Edwards, *Ann. Sc. Nat.* ser. 5, vi. pl. ii. fig. 4, pl. iii. fig. 8; the same and Oustalet in the centenary volume of the Museum of Natural History at Paris, pp. 7-21, pl. i.; and W. A. Forbes, *Ibis*, 1879, pp. 303-307.)

[1] This is virtually admitted by Count T. Salvadori (*tom. cit.* Introd. p. viii.), the latest reviser of the Order.

far back: in 1867-68 Dr. Finsch published an excellent monograph of the Parrots,[1] regarding them as a Family, in which he admitted 26 genera, forming 5 subfamilies; but only in the single group NESTOR did he recognize characters that were not external. In 1874 Garrod communicated to the Zoological Society the result of his dissection of examples of 82 species of Parrots, which had lived in its gardens, and these results were published in its *Proceedings* for that year (pp. 586-598, pls. lxx. lxxi.) The principal points to which he attended were the arrangement of the CAROTID artery, and the presence or absence of an AMBIENS muscle, an OIL-GLAND and a FURCULA; but except as regards the last character he unfortunately almost wholly neglected the rest of the skeleton, looking upon such osteological features as the formation of an orbital ring and peculiarities of the atlas as "of minor importance"—an estimate to which nearly every anatomist will demur. Indeed the investigations of Prof. A. Milne-Edwards (*Ann. Sc. Nat. Zoologie*, ser. 5, vi. pp. 91-111; viii. pp. 145-156) on the bones of the head in Parrots make it clear that these alone, and especially the maxilla, present features of much significance, and if his investigations had not been carried on for a special object, but had been extended to other parts of the skeleton, there is little doubt that they would have removed some of the greatest difficulties. The one osteological character to which Garrod trusted, namely, the condition of the furcula, contributes little towards a safe basis of classification. That it is wholly absent in some genera of Parrots had long been known, but its imperfect ossification, it appears, is not attended in some cases by any diminution of volant powers, which tends to shew that it is an unimportant character, an inference confirmed by the fact that it was found wanting in genera placed geographically so far apart that the loss must have had in some of them an independent origin. Thus grounded, his scheme was so manifestly artificial that further criticism would here be useless; the greatest merit of his method is that, as before mentioned (LOVE-BIRD), he gave sufficient reasons for distinguishing between the genera *Agapornis* and *Psittacula*. In the *Journal für Ornithologie* for 1881 Dr. Reichenow published a *Conspectus Psittacorum*, founded, as so many others[2] have been, on external characters only. He made 9 Families of the group, and recognized 45 genera, and 442 species, besides subspecies. In 1883 he brought to completion a work,[3] finely illustrated by Herr G. Mützel, which forms a concise monograph. His grouping is generally very different from Garrod's, but displays as much artificiality; for instance, *Nestor* is referred to the Family which is otherwise composed of the Cockatoos. Almost simultaneously with the last came the arrangement followed by Mr. Sclater in the *List* of those exhibited of late years in the gardens of the Zoological Society, and published in 1883. This seemed to be a manifest improvement on anything before proposed; but more recently we have Count T. Salvadori, who, while cataloguing the collection of specimens in the British Museum (*Cat. B. Brit. Mus.* xx.), came to the conclusion that 6 Families are needed. These are *Nestoridæ* (NESTOR); *Loriidæ* (LORY),[1] with 14 genera and 71 species; *Cyclopsittacidæ* (2 genera, 18 species); *Cacatuidæ* (COCKATOO), with 2 subfamilies—*Cacatuinæ* (5 or 6 genera, 26 or 27 species) and the other consisting of the well-known *Calopsitta* (COCKATEEL); *Psittacidæ*, with 6 subfamilies — *Nasiterninæ* (1 genus, 9 species), *Conurinæ*, including the MACCAWS (15 genera, 102 species), *Pioninæ* (10 genera, 91 species), *Psittacinæ* (3 genera, 8 species) *Palæornithinæ* (16 genera, 114 species) and *Platycercinæ* (11 genera, 50 species); while *Stringopidæ* (KAKAPO) completes the group. That this scheme is worthy of its author's name none can doubt, but he himself remarks that materials are not yet "sufficient for a complete study of Parrots." The separation of the first and last of these Families is unquestionably required, since they stand on a very different and much firmer footing than the other four, and the recognition of *Cacatuidæ* and *Loriidæ* is probably justifiable, as they can be without much difficulty defined, but exception may be taken to *Cyclopsittacidæ* as a Family, and the grouping of the genera of *Psittacidæ* proper is open to objection. *Pionus* and *Psittacus* certainly seem to furnish two different types, to the former of which, rather than to *Conurus*, *Psittacula* appears to be attached, bearing much the same relation thereto that *Agapornis*, placed by the Count near *Palæornis*, does to the latter. Details of this kind, however, must be expected to produce some divergence of opinion. Among the genera *Chrysotis*, *Palæornis* and *Psittacus* are probably to be found the most highly organized forms, and it is these birds in which the faculty of so-called "speech" reaches its maximum development. But too much importance must not be assigned to that fact; since, while *Psittacus erithacus*—the well-known Grey Parrot[2] with a red tail—is the most accomplished spokesman of the whole group, it is fairly approached by some species of *Chrysotis*—usually styled Amazons—and yet its congener *P. timneh* is not known to be talkative.[1]

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[1] *Die Papageien monographisch bearbeitet.* Leiden: 1867-68. 2 vols. 8vo.

[2] Such, for instance, as Kuhl's treatise with the same title, which appeared in 1820, and Wagler's *Monographia Psittacorum*, published in 1832—both good of their kind and time.

[3] *Vogelbilder aus fernen Zonen. Abbildungen und Beschreibungen der Papageien.* Kassel: 1878-83.

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[1] I take this opportunity of correcting an error (p. 520) as to the plumage of the young of *Eclectus*, which has been proved by Dr. A. B. Meyer (*Zeitschr. f. gesammte Zool.* 1882, i. pp. 146-162, 1884, i. p. 274, pl. xvi. and *Ibis*, 1890, pp. 26-29, pl. i.) to resemble that of the adult.

[2] In many foreign works this species is said to be called in English "The Jacko," but no such practice is known to me, and the assertion probably originated in the general application of the name of some particular captive. Bishop Stanley had a bird so called (Prothero, *Life of Dean Stanley*, p. 18).

Considering the abundance of Parrots both as species and individuals, and their wide extent over the globe, it is surprising how little is known of their habits in a wild state. Even the species with which Englishmen and their descendants have been more in contact than any other has an almost unwritten history, compared with that of many other birds; and, seeing how many are oppressed by and yielding to man's occupation of their ancient haunts, the extirpation of some is certain, and will probably be accomplished before several interesting and some disputed points in their economy have been decided. The experience of small islands only foreshadows what will happen in tracts of greater extent, though there more time is required to produce the same result; but, the result being inevitable, those who are favourably placed for observations should neglect no opportunities of making them ere it be too late.

PARSON-BIRD (so-called by the English in New Zealand from the two tufts of curled and filamentary white feathers hanging beneath its chin, which were supposed to resemble the bands worn until lately by clerics), the *Prosthematodera novæ-zealandiæ* of modern ornithology. Made known on the publication of Cook's First Voyage (i. p. 98), where it is figured as the Poe or Poy-bird,[2] in 1776 it was technically described by Pennant and figured by Peter Brown (*Illustr. Zool.* p. 18, pl. ix.) from a specimen in Tunstall's collection still existing in the Museum at Newcastle-on-Tyne (Fox, *Synops. Newc. Mus.* p. 138). The bird belongs to the *Meliphagidæ* (HONEY-EATER), and is in many ways one of the most remarkable of them, being generally of glossy black with vivid green or blue reflexions, while in addition to the white gular tufts, the feathers on the sides of the neck are curved forwards and white-shafted, the greater wing-coverts also being white. It is a fine songster, and a great favourite in captivity, learning to mimic various noises, including the human voice.[1] In fine weather, as remarked by Mr. Layard (*Ibis*, 1863, p. 243), this species has the habit of mounting aloft in parties of half a dozen or more and indulging in various aerial evolutions. Another merit it possesses is that of being an excellent bird for the table, but probably few in future will have the opportunity of tasting its good qualities. Dr. Gadow has described (*Proc. Zool. Soc.* 1883, pp. 67-69, pl. xvi. figs. 6, 7) the peculiar lingual apparatus and mode of feeding of this bird.

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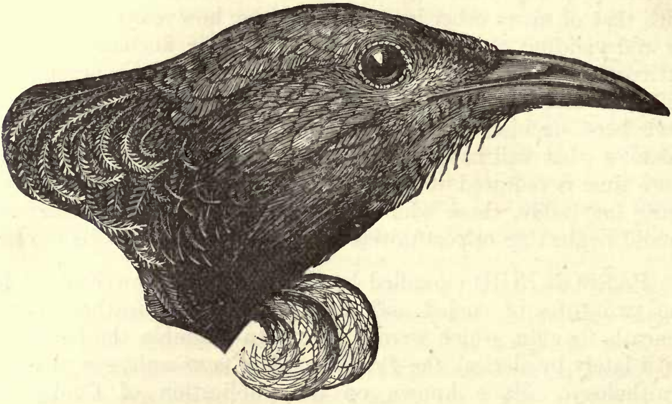
[1] In connexion with the "speaking" of Parrots, one of the most curious circumstances is that recorded by Humboldt, who states (*Ansichten der Natur*, ed. 3, i. p. 285, Engl. transl. p. 172) that in South America he met with a venerable bird which remained the sole possessor of a literally dead language, the whole tribe of Indians, Atures by name, who alone had spoken it, having become extinct. This incident was the theme of a poem by Curtius, printed in Humboldt's volume, and how cleverly it has been worked into a romance by a recent novelist all well know; but unfortunately there are people who will have it that the romance of the story did not begin with Mr. Grant Allen.

[2] This name, for a long while used in the books, was given by Cook's people, who compared the bird's remarkable gular tufts to the earrings worn by the Tahitians, and called *Poies*, as the word was then written. But *Kago* is given as the native name of the bird, and in the form *Koko* is still used, though *Tui* is the commoner appellation.



PROSTHEMATODERA. (After Buller.)

PARSON-GULL, a common name for the adult of either of the Black-backed GULLS, *Larus marinus* and *fuscus*.

PARTRIDGE, in older English *Pertriche*, Scottish *Patrick*, Dutch *Patrijs*, French *Perdrix*, all from the Latin *Perdix*, which word in sound does not imitate badly the call-note of this bird, so well known throughout the British Islands and the greater part of Europe[2] as to need no description or account of its habits here. The English name properly denotes the only species indigenous to Britain, often nowadays called the Grey Partridge[3] (to distinguish it from others, of which more presently), the *Perdix cinerea* of ornithologists, a species which may be regarded as the model game-bird—whether from the excellence of the sport it affords in the field, or the no less excellence of its flesh at table, which has been esteemed from the time of Martial to our own—while it is on all hands admitted to be wholly innocuous, and at times beneficial to the agriculturist. It is an undoubted fact that the Partridge thrives with the highest system of cultivation; and the lands that are the most carefully tilled, and bear the greatest quantity of grain and green crops, generally produce the greatest number of Partridges. Yielding perhaps in economic importance to the Red GROUSE, what may be called the social influence of the Partridge is greater than that excited by any other wild bird, for there must be few rural parishes in the three kingdoms of which the inhabitants are not more or less directly affected in their movements and business by the coming in of Partridge-shooting, and therefore a few words on this theme may not be out of place.

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[1] Sir W. Buller tells us how that having addressed a Maori assemblage in the course of a negotiation, at the end of his speech the chief's tame Tui exclaimed "Tita" (false), whereupon the dignitary remarked that the arguments were no doubt good, but they had failed to convince his bird.

[2] More than one local form has been said to exist on the continent if not in Britain. One such, inhabiting the north-west of Spain, seems worthy of notice. It was described by Dr. Reichenow (*Journ. für Orn.* 1892, p. 226) as *P. hispaniensis*, which Dr. Sharpe (*Zool. Rec.* xxix. *Aves*, p. 27) has rendered *P. hispaniolensis*.

[3] In India the name Grey Partridge is used for *Ortygornis ponticerianus*, which is perhaps a FRANCOLIN (*cf.* Jerdon, *B. Ind.* iii. p. 569).

From the days when men learned to "shoot flying" until the latter half of this century, dogs were generally if not invariably used to point out where the "covey," as a family-party of Partridges is called, was lodged, and the greatest pains were taken to break in the "pointers" or "setters" to their duty. In this way marvellous success was attained, and the delight lay nearly as much in seeing the dogs quarter the ground, wind and draw up to the game, helping them at times (for a thorough understanding between man and beast was necessary for the perfection of the sport) by word or gesture, as in bringing down the bird after it had been finally sprung. There are many who lament that the old-fashioned practice of shooting Partridges to dogs has, with rare exceptions, fallen into desuetude, and it is commonly believed that this result has followed wholly from the desire to make larger and larger bags of game. The opinion has a certain amount of truth for its base; but those who hold it omit to notice the wholly changed circumstances in which Partridge-shooters now find themselves. In the old days there were plenty of broad, tangled hedgerows which afforded permanent harbour for the birds, and at the beginning of the shooting-season admirable shelter or "lying" (to use the sportsman's word) was found in the rough stubbles, often reaped knee-high, foul with weeds and left to stand some six or eight weeks before being ploughed, as well as in the turnips that were sown broadcast. Throughout the greater part of England now the fences are reduced to the narrowest of boundaries and are mostly trimly kept; the stubbles—mown, to begin with, as closely as possible to the ground—are ploughed within a short time of the corn being carried, and the turnips are drilled in regular lines, offering inviting alleys between them along which Partridges take foot at any unusual noise. Pointers in such a district—and to this state of things all the arable part of England is tending—are simply useless, except at the beginning of the season, when the young birds are not as yet strong on the wing, and the old birds are still feeble from moulting their quill-feathers. Of late years therefore other modes of shooting Partridges have had to be employed, of which methods the most popular is that known as "driving"—the "guns" being stationed in more or less concealment at one end of the field, or series of fields, which is entered from the other by men or boys who deploy into line and walk across it making a noise. It is the custom with many to speak depreciatingly of this proceeding, but it is a fact that as much knowledge of the ways of Partridges is needed to ensure a successful day's "driving" as was required of old when nearly everything was left to the intelligence of the dogs, for the course of the birds' flight depends not only on the position of the line of beaters, but almost on the station of each person composing it, in relation to the force and direction of the wind and to the points on which it is desired that the Partridges should converge. Again, the skill and alacrity needed for bringing down birds flying at their utmost velocity, and often at a considerable height, is enormously greater than that which sufficed to stop those that had barely gone 20 yards from the dog's nose, though admittedly Partridges rise very quickly and immediately attain great speed. Moreover, the shooting of Partridges to pointers came to an end in little more than six weeks, whereas "driving" may be continued for the whole season, and is never more successful than when the birds, both young and old, have completed their moult, and are strongest upon the wing. But, whether the new fashion be objectionable or not, it cannot be doubted that the old one could not be successfully restored without a reversion to the slovenly methods of agriculture followed in former years, and therefore is as impossible as would be a return to the still older practice of taking Partridges in a setting-net, described by Gervase Markham or Willughby.

The Partridge has doubtless largely increased in numbers in Great Britain since the beginning of the present century, when so much down, heath and moorland was first brought under the plough, for its partiality to an arable country is very evident. It has been observed that the birds which live on grass lands or heather only are apt to be smaller and darker in colour than the average; but in truth the species when adult is subject to a much greater variation in plumage than is commonly supposed, and the well-known chestnut horse-shoe mark, generally considered distinctive of the cock, is very often absent.[1] In Asia our Partridge seems

[1] Mr. W. R. Ogilvie Grant has indicated certain characters in the plumage of the two sexes of this species whereby they may be unfailingly distinguished. In the adult cock the sides of the neck are grey, but in the hen olive-brown, while

to be unknown, but in the temperate parts of Eastern Siberia its place is taken by a very nearly allied form, *P. barbata*, and in Tibet there is a bird, *P. hodgsoniæ*, which can hardly with justice be generically separated from it. The relations of some other forms inhabiting the Indian Region are at present too obscure to make any notice of them expedient here.

The common Red-legged Partridge of Europe, generally called the French Partridge, *Caccabis rufa*, seems to be justifiably considered the type of a separate group.[1] This bird was introduced into England toward the end of the eighteenth century, and has established itself in various parts of the country, notwithstanding a widely-spread, and in some respects unreasonable prejudice against it. It has certainly the habit of trusting nearly as much to its legs as to its wings, and it thus incurred the obloquy of old-fashioned sportsmen, whose dogs it vexatiously kept at a running-point; but when it was also accused of driving away the grey Partridge, the charge only shewed the ignorance of those that brought it, for as a matter of fact the French Partridge rather prefers ground which the common species avoids —such as the heaviest clay-soils, or the most infertile heaths. But even where the two species meet, the present writer can declare from the personal observation of many years that the alleged antipathy between them is imaginary, and unquestionably in certain parts of the country the "head of game" has been increased by the introduction of the foreigner.[2] The French

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nearly each feather shews a buff shaft-stripe. Again the median upper wing-coverts in the cock are of a sandy-brown blotched with chestnut and black transverse lines, while in the hen the corresponding feathers are blackish-brown with conspicuous buff crossbars. I am much indebted to Lord Lilford and Mr. Beilby Oakes for kindly informing me that, after examining a great many Partridges, they can wholly confirm Mr. Grant's observations, which having been originally published in a newspaper (*Field*, 21 Nov. 1891 and 9 April 1892), and only incidentally mentioned by him in a scientific work (*Cat. B. Br. Mus.* xxii. p. 185) will be new to many persons.

[1] The late Prof. Parker first (*Trans. Zool. Soc.* v. p. 155) and, after him, Prof. Huxley (*Proc. Zool. Soc.* 1868, pp. 299-302) pointed out that the true *Gallinæ* offer two types of structure, "one of which may be called Galline, and the other Tetraonine," to use the latter's words, though he is "by no means clear that they do not graduate into one another"; and, according to the characters assigned by him, *Caccabis* lies "on the Galline side of the boundary," while *Perdix* belongs to the Tetraonine group. Further investigation of this matter is very desirable, and, with the abundant means possessed by those who have access to zoological gardens, it might easily be carried out.

[2] It is a singular fact that the game-preservers who object most strongly to the Red-legged Partridge are not agreed on the exact grounds of their objection. One party will declare that it vanquishes the Grey Partridge, while the other holds that, though the latter, the "English" Partridge, is much vexed by the introduced species, it invariably beats off the "Frenchman"!

Partridge has several congeners, all with red legs and plumage of similar character. In Africa north of the Atlas there is the Barbary Partridge, *C. petrosa*; in southern Europe another, *C. saxatilis*, which extends eastward till it is replaced by *C. chukar*, which reaches India, where it is a well-known bird. Two very interesting desert-forms, supposed to be allied to *Caccabis*, are the *Ammoperdix heyi* of North Africa and Palestine and the *A. bonhami* of Persia; but the absence of the metatarsal knob, or incipient spur, suggests (in our ignorance of their other osteological characters) an alliance rather to the genus *Perdix*. On the other hand the groups of birds known as FRANCOLINS and Snow-Partridges are generally furnished with strong but blunt spurs, and therefore probably belong to the Caccabine group. Of the former, containing many species, there is only room here to mention, in addition to what has been before (page 291) said of that which used to occur in Europe, the possibility, as some think, of its having been the *Attagas* or *Attagen* of classical authors,[1] a bird celebrated for its exquisite flavour. Of the latter it is only to be said here that those of the genus *Tetraogallus*, often called Snow-PHEASANT, are the giants of their kin, and that nearly every considerable range of mountains in Asia seems to possess its specific form; while the genus *Lerwa* contains but a single species, *L. nivicola*, which is emphatically the Snow-Partridge of Himalayan sportsmen.

By English colonists the name Partridge has been very loosely applied, and especially so in North America. Where a qualifying word is prefixed no confusion is caused, but without it there is sometimes a difficulty at first to know whether the Ruffed GROUSE (*Bonasa umbellus*) or the Virginian COLIN (*Ortyx virginianus*) is intended, while the "Partridge-Hawk" of the same country is *Astur atricapillus* (GOSHAWK), and the "Partridge-Pigeon" of Australia is a species of *Geophaps* (BRONZE-WING).

PASSAGE-HAWK, in modern falconers' language, is one taken on its passage or migration, generally in Holland. It is therefore always what in old time was called a "Haggard," and when trained is more valued than a NIAS.

PASSENGER-PIGEON, so-called in books, but in North America commonly known as the "Wild Pigeon," the *Ectopistes migratorius* of ornithology, the bird so famous in former days for its multitude, and still occasionally to be found plentifully in some parts of Canada and the United States, though no longer appearing in the countless numbers that it did of old, when a flock seen by Wilson was estimated to consist of more than 2230 millions. The often-quoted descriptions given by him and Audubon of Pigeon-haunts in the then "back-woods" of Kentucky, Ohio and Indiana need not here be reproduced. That of the latter was declared by Waterton to be a gross exaggeration if not an entire fabrication; but the critic would certainly have changed his tone had he known that, some hundred and fifty years earlier, Wild Pigeons so swarmed and ravaged the colonists' crops near Montreal that a bishop of his own Church was constrained to exorcise them with holy water as if they had been demons.[1] The rapid and sustained flight of these Pigeons is also as well-established as their former overwhelming abundance—birds having been killed in the State of New York whose crops contained undigested grains of rice that must have been not long before plucked and swallowed in South Carolina or Georgia. The Passenger-Pigeon is about the size of a common Turtle-DOVE, but with a long, wedge-shaped tail. The male is of a dark slate-colour above, and purplish-bay beneath, the sides of the neck being enlivened by gleaming violet, green and gold. The female is drab-coloured above and dull white beneath, with only a slight trace of the brilliant neck-markings[2] (see PIGEON).

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[1] However, many naturalists have maintained a different opinion—some making it a WOODCOCK, a GODWIT, or even the Hazel-hen (GROUSE). The question has been well discussed by Lord Lilford (*Ibis*, 1862, pp. 352-356).

PASSERES, the name given by Linnæus to his Sixth Order of Birds, which though for a time set aside in favour of other designations, INSESSORES and the like, or modified into such a form as PASSERINÆ,[3] has been restored to use of late years, and approximately in its author's sense—the genera *Certhia*, *Sitta*, *Oriolus*, *Gracula*, *Corvus* and *Paradisea*, which he had placed in his PICÆ, being added, while *Caprimulgus*, the portion of *Hirundo* containing the SWIFTS, and *Columba* have been removed. For further subdivision of the Order, which, though offering comparatively little variation of essential importance, comprehends far more genera and species than all the others put together, see INTRODUCTION.

PASSERINÆ, a group so named of Nitzsch in 1820 (*Deutsche Archiv für Physiol.* vi. p. 253) to include the genera *Sturnus*, *Oriolus*, *Lanius*, *Muscicapa*, *Ampelis*, *Hirundo*, *Turdus*, *Accentor*, *Sylvia*, *Motacilla*, *Anthus*, *Alauda*, *Parus*, *Sitta*, *Certhia* (with *Tichodroma*),

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[1] *Voyages du Baron de la Hontan dans l'Amerique septentrionale*, ed. 2, Amsterdam: 1705, vol. i. pp. 93, 94. In the first edition, published at The Hague in 1703, the passage, less explicit in details but to the same effect, is at p. 80. The author's letter, describing the circumstance, is dated May 1687.

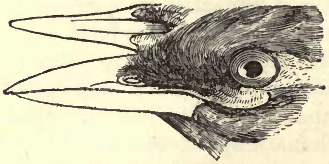
[2] There are several records of the occurrence in Britain of this Pigeon, but in most cases the birds noticed cannot be supposed to have found their own way hither. One, which was shot in Fife in 1825, may, however, have crossed the Atlantic unassisted by man.

[3] The names *Passeriformes* and lately even *Passeridæ* (!) have been in some instances employed; with very slight or no modification they signify the same thing as *Passerinæ*.

Emberiza, *Fringilla*, *Loxia*, *Cinclus* (?) and *Corvus*—thus differing somewhat from Johannes Müller's application of the cognate term

PASSERINI (*Abhandl. K. Akad. Berlin*, *Phys. Kl.* 1847, p. 366), which he regarded as equivalent to the Order INSESSORES (as it was then called), separating its members into *Passerini* POLYMYODI (or OSCINES), TRACHEOPHONES and PICARII, though cautiously declaring these to be not so much the names of groups, but as merely indicating different laryngeal formations.

PASTOR, Temminck's generic name in 1815 for a beautiful bird, the *Turdus roseus* of Linnæus, very commonly known in English as the Rose-coloured Pastor, one of the *Sturnidæ* (STARLING), which is not an infrequent visitor to the British Islands. It is a bird of most irregular and erratic habits—a vast horde suddenly arriving at some place to which it may have hitherto been a stranger, and at once making a settlement there, leaving it wholly deserted so soon as the young are reared. This happened in the summer of 1875 at Villafranca, in the province of Verona, the castle of which was occupied in a single day by some 12,000 or 14,000 birds of this species, as has been graphically told by Sig. de Betta (*Atti del R. Ist. Veneto*, ser. 5, vol. ii.); but similar instances have been before recorded,—as in Bulgaria in 1867, near Smyrna in 1856, and near Odessa in 1844, to mention only some of which particulars have been published,[1] and a concise account of them will be found in the Fourth Edition of Yarrell's *British Birds* (ii. pp. 245-250). The Rose-coloured Starling hardly ever occurs in Africa, but is a well-known bird in India, over nearly the whole of which it regularly appears, and generally in the cold weather.



PASTOR. (After Swainson.)

PASTURE-BIRD, a name indiscriminately given in parts of North America and the West Indies to any of the STINTS and smaller SANDPIPERS met with on their autumnal migration, and then mostly resorting to the cattle-pastures.

PATELLA, a sesamoid bone interposed in the tendon of the *extensor-cruris* muscle, and connected with the upper end of the TIBIA by the Patellar Ligament, which in old birds is often ossified. The most remarkable variations of condition are shewn in *Colymbus*, where the Patella is reduced to a small ossicle within the tendon, its function being taken by the greatly-developed pyramidal *processus tibialis anterior*, and in *Podicipes* and *Hesperornis*, where it is almost as large as the cnemial process with which it freely articulates.

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[1] It is remarkable that on almost all of these occasions the locality pitched upon has been, either at the time or soon after, ravaged by locusts, which the birds greedily devour. Another fact worthy of attention is that they are often observed to affect trees or shrubs bearing rose-coloured flowers, as *Nerium oleander* and *Robinia viscosa*, among the blossoms of which they themselves may easily escape notice, for their plumage is rose-pink and black shot with blue.

PEACOCK (the first syllable from the Latin *Pavo*, in Anglo-Saxon *Pawe*, Dutch *Paauw*, German *Pfau*, French *Paon*), the bird so well known from the splendid plumage of the male, and as the proverbial personification of pride. A native of the Indian peninsula and Ceylon, in some parts of which it is very abundant, its domestication dates from times so remote that nothing can be positively stated on that score. Setting aside its importation to Palestine by Solomon (1 Kings x. 22; 2 Chron. ix. 21), its assignment in classical mythology as the favourite bird of Hera or Juno testifies to the early acquaintance the Greeks must have had with it; but, though it is mentioned by Aristophanes and other older writers, their knowledge of it was probably very slight until after the conquests of Alexander. Throughout all succeeding time, however, it has never very willingly rendered itself to domestication, and, retaining much of its wild character, can hardly be accounted an inhabitant of the poultry-yard, but rather an ornamental denizen of the pleasure-ground or shrubbery; while, even in this condition, it is seldom kept in large numbers, for it has a bad reputation for doing mischief in gardens, it is not very prolific, and, though in earlier days highly esteemed for the table,[1] it is no longer considered the delicacy it was once thought.

As in most cases of domestic animals, pied or white varieties of the ordinary Peacock, *Pavo cristatus*, are not unfrequently to be seen; and, though lacking the gorgeous resplendence for which the common bird stands unsurpassed, they are valued as curiosities. Greater interest, however, attends what is known as the "japanned" Peacock, often erroneously named the Japanese or Japan Peacock, a form which has received the name of *P. nigripennis*, as though it were a distinct species. In this form the cock, beside other less conspicuous differences, has all the upper wing-coverts of a deep lustrous blue instead of being mottled with brown and white, while the hen is of a more or less greyish-white, deeply tinged with dull yellowish-brown near the base of the neck and shoulders. It "breeds true"; but occasionally a presumably pure stock of birds of the usual coloration throws out one or more having the

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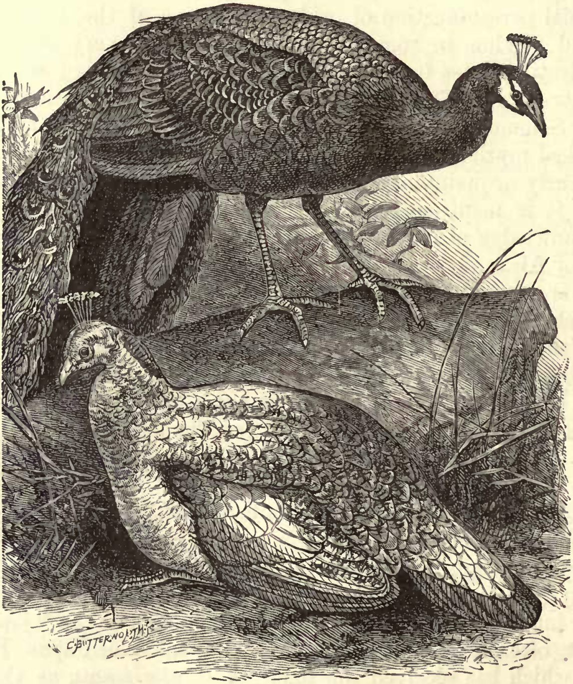
[1] Classical authors contain many allusions to its high appreciation at the most sumptuous banquets; and mediæval bills of fare on state occasions nearly always include it. In the days of chivalry one of the most solemn oaths was taken "on the Peacock," which seems to have been served up garnished with its gaudy plumage.

"japanned" plumage, leading to the conclusion that the latter may be due to "reversion to a primordial and otherwise extinct condition of the species," and it is to be observed that the "japanned" male has in the coloration of the parts mentioned no little resemblance to that of the second indubitably good species, the *P. muticus* (or *P. spicifer* of some writers) of Burma and Java, though the character of the latter's crest—the feathers of which are barbed along their whole length instead of at the tip only—and its golden-green neck and breast furnish a ready means of distinction. The late Sir R. Heron was confident that the "japanned" breed had arisen in England within his memory,[1] and Darwin (*Anim. and Plants under Domestic.* i. pp. 290-292) was inclined to believe it only a variety; but its abrupt appearance, which rests on indisputable evidence, is most suggestive in the light that it may



"JAPANNED" PEAFOWLS. (After Wolf in Elliot's '*Phasianidæ*.')

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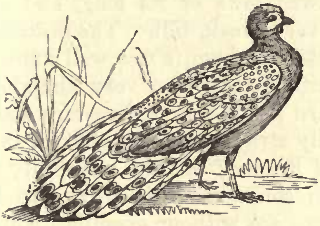
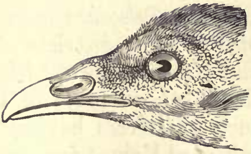
[1] This may have been the case as regards England; but I have a distinct recollection of having seen a bird of this form represented in an old Dutch picture, though when or where I cannot state. An instance of its sudden production from the ordinary stock occurred to my own knowledge as mentioned by Mr. Darwin.

one day throw on the question of evolution as exhibited in the origin of "species." It should be stated that the "japanned" bird is not known to exist anywhere as a wild race.

The Peafowls belong to the *Gallinæ*, from the normal members of which they do not materially differ in structure; and, though by some systematists they are raised to the rank of a Family, *Pavonidæ*, most are content to regard them as a subfamily of *Phasianidæ* (PHEASANT).[1] Akin to the genus *Pavo* is *Polyplectrum*, of which the males are armed with two or more spurs on each leg, and near them is generally placed the genus *Argusianus*, containing the ARGUS-Pheasants, remarkable for their wonderfully ocellated plumage, and the extraordinary length of the secondary quills of their wings, as well as of the tail-feathers. It must always be remembered that the so-called "tail" of the Peacock is formed not by the rectrices or true tail-feathers, but by the singular development of the tail-coverts, a fact of which any one may be satisfied by looking at the bird when these magnificent plumes are erected and expanded in disk-like form, as is his habit when displaying his beauty to his mates.



POLYPLECTRUM.



ARGUS-PHEASANT.

(After Swainson.)

PEASEWEEP (spelling uncertain), the Scottish form of PEWIT, but applied to the LAPWING only.

PECTEN, a fan-like lamella which projects into the posterior chamber of the EYE, near the entrance of the optic nerve, and is found in all Birds except *Apteryx*.

PECTINEAL PROCESS (so called from the attachment to it of the Pectineal muscle), a process, near the anterior margin of the acetabulum (see ODONTORNITHES, fig. 4 *a*, page 650), and is in Birds formed by the *os pubis* alone, by the os pubis and ilium jointly, or occasionally by the ilium alone. When formed wholly by the pubic bone and well developed, as in *Apteryx* and *Centrococcyx*, it strongly resembles the so-called "prepubis" of Dinosaurs and other Reptiles.

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[1] As Mr. Elliot does in his magnificent *Monograph of the Phasianidæ*.

PEEP, used chiefly in North America for any of the STINTS or small SANDPIPERS from their cry.

PEGGY, a common name of the WHITETHROAT.

PELARGOMORPHÆ, Prof. Huxley's name (*Proc. Zool. Soc.* 1867, p. 461) for that group of DESMOGNATHÆ which contains the Storks, Herons, Ibises and Spoonbills.

PELICAN (Fr. *Pélican*, Lat. *Pelecanus* or *Pelicanus*), a large fish-eating water-fowl, remarkable for the enormous pouch formed by the extensible skin between the lower jaws of its long, and apparently formidable but in reality very weak, bill. The ordinary Pelican, the *Onocrotalus* of the ancients, to whom it was well known, and the *Pelecanus onocrotalus* of ornithologists, is a very abundant bird in some districts of South-eastern Europe, South-western Asia, and North-eastern Africa, occasionally straying, it is believed, into the northern parts of Germany and France; but the possibility of such wanderers having escaped from confinement is always to be regarded,[1] since few zoological gardens are without examples which are often in the finest condition. Its usual haunts are the shallow margins of the larger lakes and rivers, where fishes are plentiful, since it requires for its sustenance a vast supply of them, pursuing them under water, and rising to the surface to swallow those that it has captured in its capacious pouch. The nest is formed among the reeds that border the waters it frequents, placed on the ground and lined with grass. Therein two eggs, with white, chalky shells, are commonly laid. The young during the first twelvemonth are of a greyish-brown, but this dress is slowly superseded by the growth of white feathers, until when mature almost the whole plumage, except the black primaries, is white, deeply suffused by a rich blush of rose or salmon-colour, passing into yellow on the crest and lower part of the neck in front. A second and somewhat larger species, *P. crispus*, also inhabits Europe, but in smaller numbers. This, when adult, is readily distinguishable from the ordinary bird by the absence of the blush from its plumage, and by the curled feathers that project from and overhang each side of the head, which with some differences of coloration of the bill, pouch, bare skin round the eyes, and irides give it a wholly distinct expression.[2] Two specimens of the humerus of as many Pelicans have been found in the English fens (*Ibis*, 1868, p. 363; *Proc. Zool. Soc.* 1871, p. 702), thus proving the former existence of the bird in England at no very distant period, and one of them being that of a young example points to its having been bred in this country. It is possible from their large size that they belonged to *P. crispus.* Ornithologists have been much divided in opinion as to the number of living species of the genus *Pelecanus* (*cf. op. cit.* 1868, p. 264; 1869, p. 571; 1871, p. 631)—the estimate varying from six to ten or eleven; but the former is the number recognized by M. Dubois (*Bull. Mus. Belg.* 1883). North America has one, *P. erythrorhynchus*, very similar to *P. onocrotalus* both in appearance and habits, but remarkable for a triangular, compressed, horny excrescence which is developed on the ridge of the male's bill in the breeding-season, and, as ascertained by Mr. Ridgway (*Ibis*, 1869, p. 350), falls off without leaving trace of its existence when that is over (*cf.* MOULT, page 599). Australia has *P. conspicillatus*, easily distinguished by its black tail and wing-coverts. Of more marine habit are *P. philippensis* and *P. fuscus*, the former having a wide range in Southern Asia, and, it is said, reaching Madagascar, and the latter being common on the coasts of the warmer parts of both North and South America.[1]

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[1] This caution was not neglected by the prudent, even so long ago as Sir Thomas Browne's days; for he, recording the occurrence of a Pelican in Norfolk, was careful to notice that about the same time one of the Pelicans kept by the king (Charles II.) in St. James's Park had been lost. Charleton says (*Onomast.* p. 94) they came from the Czar.

[2] It is also said to have twenty-two rectrices, while the ordinary species has only eighteen.

PELVIS, that part of the trunk to which are attached the hind limbs, and consisting of a number of fused vertebræ, beside three coalescent portions on either side of the Median line—the ILIUM, ISCHIUM and OS PUBIS (see SKELETON).

PEN, said by Yarrell to be the technical name of the hen Mute SWAN, the cock being called COB.

PENELOPE, the generic name most inappropriately given by Merrem to the GUANS and occasionally used as English.

PENGUIN, the name of a flightless sea-bird,[2] but, so far as is known, first given, as in Hore's "Voyage to Cape Breton," 1536 (Hackluyt, *Researches*, iii. pp. 168-170), to one inhabiting the seas of Newfoundland, which subsequently became known as the Great Auk or GARE-FOWL; and, though the French equivalent *Pingouin*[1] preserves its old application, at the present day, the word Penguin is by English ornithologists always used in a general sense for certain Birds inhabiting the Southern Ocean, called by the French *Manchots*, the *Spheniscidæ* of ornithologists, which in some respects form perhaps the most singular group of the whole Class, or at least we may say of the *Carinatæ*. For a long while their position was very much misunderstood, some of the best of recent or even living systematists having placed them in close company with the *Alcidæ* (AUKS), to which they bear only a relationship of analogy, as indeed had been perceived by a few ornithologists, who recognized in the Penguins a very distinct Order, IMPENNES. The view of the latter is hardly likely to be disputed in future, now that the anatomical researches of MM. Paul Gervais and Alix (*Journ. de Zool.* 1877, pp. 424-470), M. Filhol (*Bull. Soc. Philomath.* ser. 7, vi. pp. 226-248), and above all of Prof. Watson (*Zoology*, *Voy. Challenger*, part xviii.) have put the independent position of the *Spheniscidæ* in the clearest light.[2] The most conspicuous outward character presented by the Penguins is the total want of quills in their wings, which are beside

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[1] The genus *Pelecanus* as instituted by Linnæus included the CORMORANT and GANNET as well as the true Pelicans, and for a long while these and some other distinct groups, as the SNAKE-BIRDS, FRIGATE-BIRDS, and TROPIC-BIRDS, which have all the four toes of the foot connected by a web, were regarded as forming a single Family, *Pelecanidæ*; but this name has now been restricted to the Pelicans only, though all are still usually associated under the name STEGANOPODES. It may be necessary to state that there is no foundation for the venerable legend of the Pelican feeding her young with blood from her own breast, which has given her an important place in ecclesiastical heraldry, except that, as Mr. Bartlett has suggested (*Proc. Zool. Soc.* 1869, p. 146), the curious bloody secretion ejected from the mouth of the FLAMINGO may have given rise to the belief, through that bird having been mistaken for the "Pelican of the wilderness."

[2] Of the three derivations assigned to this name, the first is by Drayton in 1613 (*Polyolbion*, Song 9), where it is said to be the Welsh *pen gwyn*, or "white head"; the second, which seems to meet with Littré's approval, deduces it from the Latin *pinguis* (fat); the third supposes it to be a corruption of "pin-wing" (*Ann. Nat. Hist.* ser. 4, iv. p. 133), meaning a bird that has undergone the operation of pinioning or, as in one part at least of England it is commonly called,

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"pin-winging." In opposition to the first of these hypotheses it has been urged (1) that there is no real evidence of any Welsh discovery of the bird, (2) that it is very unlikely for the Welsh, if they did discover it, to have been able to pass on their name to English navigators, and (3) that it had not a white head, but only a patch of white thereon. To the second hypothesis Prof. Skeat (*Etymol. Dict.* p. 433) objects that it "will not account for the suffix *-in*, and is therefore wrong; besides which the 'Dutchmen' [who were asserted to be the authors of the name] turn out to be Sir Francis Drake" and his men. In support of the third hypothesis Mr. Reeks wrote (*Zoologist*, ser. 2, p. 1854) that the people in Newfoundland who used to meet with this bird always pronounced its name "Pin-wing." Prof. Skeat's enquiry (*loc. cit.*), whether the name may not after all be South-American, is to be answered in the negative, since, so far as evidence goes, it was given to the North-American bird before the South-American was known in Europe.

[1] *Gorfou* has also been used by some French writers, being a corruption of *Geirfugl* or Gare-fowl.

[2] Though I cannot wholly agree with Prof. Watson's conclusions, his remarks (pp. 230-232) on the "Origin of the Penguins" are worthy of all attention. He considers that they are the surviving members of a group that branched off early from the primitive "avian" stem, but that at the time of their separation the stem had diverged so far from Reptiles as to possess true wings, though the metatarsal bones had not lost their distinctness and become fused into the single bone so characteristic of existing Birds. The ancestral Penguin, he argues, must have had functional wings, the muscles of which, through atrophy, have been converted into non-contractile tendinous bands, and this view agrees practically with that taken by Prof. Fürbringer and Dr. Gadow.

as incapable of flexure as the flippers of a Cetacean, though they move freely at the shoulder-joint, and some at least of the species occasionally make use of them for progressing on land. In the water they are most efficient paddles, and are usually, if not always, worked, as birds' wings commonly are (*cf.* FLIGHT, pp. 267-269), with a rotatory action. The plumage which clothes the whole body, leaving no bare spaces, generally consists of small scale-like feathers, many of them consisting only of a simple shaft without the development of barbs; but several of the species have the head decorated with long cirrhous tufts (MACCARONI), and in some the tail-quills, which are very numerous, are also long.[1] In standing these birds preserve an upright position, generally resting on the "tarsus"[2] alone, but in walking or running on land this is kept nearly vertical, and their weight is supported by the toes as well.

The most northerly limit of the Penguins' range in the Atlantic is Tristan da Cunha, and in the Indian Ocean Amsterdam Island, but they also occur off the Cape of Good Hope and along the south coast of Australia, as well as on the south and east of New Zealand, while in the Pacific one species at least extends along the west coast of South America and to the Galapagos; but north of the equator none are found. In the breeding-season they resort to the most desolate lands in higher southern latitudes, and indeed have been met with as far to the southward as navigators have penetrated. Possibly the Falkland Islands may still be regarded as the locality richest in species,[3] though, whatever may have been the case once, their abundance there as individuals does not now nearly approach what it is in many other places, owing to the ravages of man, whose advent is always accompanied by massacre and devastation on an enormous scale—the habit of the helpless birds, when breeding, to congregate by hundreds and thousands in what are called "Penguin-rookeries" contributing to the ease with which their slaughter can be effected. Incapable of escape by flight, they are yet able to make enough resistance or retaliation (for they bite hard when they get the chance) to excite the wrath of their murderers, and this only brings upon them greater destruction, so that the interest of nearly all the numerous accounts of these "rookeries" is spoilt by the disgusting details of the brutal havoc perpetrated upon them (*cf.* JOHNNY).

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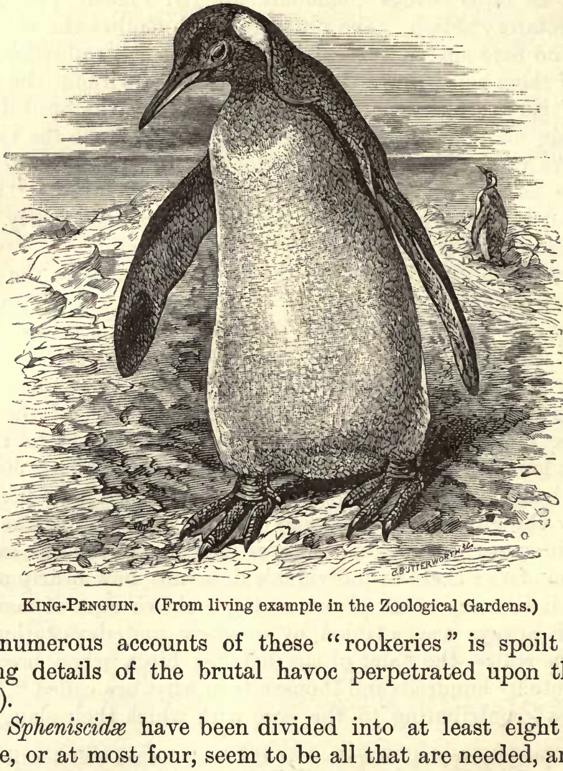
[1] The pterylographical characters of the Penguins are well described by Mr. Hyatt (*Proc. Boston Soc. Nat. Hist.* 1871). Mr. Bartlett has observed (*Proc. Zool. Soc.* 1879, pp. 6-9) that, instead of moulting in the way that birds ordinarily do, Penguins, at least in passing from the immature to the adult dress, cast off the short scale-like feathers from their wings in a manner that he compares to "the shedding of the skin in a serpent."

[2] The three metatarsals in the Penguins are not, as in other Birds, united for the whole of their length, but only at the extremities, thus preserving a portion of their originally distinct existence, a fact probably attributable to arrest of development, since the researches of Prof. Gegenbaur shew that the embryos of all Birds, so far as is known, possess these bones in an independent condition. More recently Prof. Marsh has found that in the Dinosaurian genus *Ceratosaurus* the metatarsals acquire a condition very similar to that which they present in the Penguins (*Am. Journ. Sc.* Aug. 1884).

[3] An interesting account of the Penguins of these islands is given by Capt. Abbott (*Ibis*, 1860, p. 336).


G. BUTTERWORTH Sc.

KING-PENGUIN. (From living example in the Zoological Gardens.)

The *Spheniscidæ* have been divided into at least eight genera, but three, or at most four, seem to be all that are needed, and three can be well distinguished, as pointed out by Dr. Coues (*Proc. Ac. N. Sc. Philad.* 1872, pp. 170-212), by anatomical as well as by external characters. They are (1) *Aptenodytes*, easily recognized by its long and thin bill, slightly decurved, from which *Pygoscelis*, as Prof. Watson has shewn, is hardly distinguishable; (2) *Eudyptes*, in which the bill is much shorter and somewhat broad; and (3) *Spheniscus*, in which the shortish bill is compressed and the maxilla ends in a conspicuous hook. *Aptenodytes* contains the largest species, among them those known as the "Emperor" and "King" Penguins, *A. patagonica* and *A. longirostris.*[1] Three others belong also to this genus, if *Pygoscelis* (JOHNNY) be not recognized, but they seem no further to require remark. *Eudyptes*, containing the crested Penguins (known to sailors as Rock-hoppers or MACCARONIS), would appear to have five species, and *Spheniscus* (JACKASS) four, among which *S. demersus*, the well-known "Cape Penguin," and *S. mendiculus*, which occurs in the Galapagos, and therefore has the most northerly range of the whole group, alone need notice here.[1]

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[1] Some authorities (*cf.* Sclater, *Ibis*, 1888, pp. 325-334) prefer calling these species *A. forsteri* and *A. pennanti.* An example of the former, weighing 78 pounds, was, according to Dr. M'Cormick (*Voyages of Discovery*, i. p. 259), obtained by the 'Terror' in January 1842.

PERCHERS, the rendering by popular writers of the word INSESSORES, now almost wholly abandoned by systematists.

PEREGRINE (Lat. *peregrinus*, wandering) an adjective often mistaken for a substantive, and used as an abbreviation of Peregrine FALCON, an expression that originally meant one of foreign origin, regardless of the species.

PERISTEROMORPHÆ, according to Prof. Huxley's taxonomy (*Proc. Zool. Soc.* 1867, pp. 459, 460), the sixth group of SCHIZOGNATHÆ, consisting of the *Columbæ* (DOVE, PIGEON), but not to be confounded with his

PERISTEROPODES, a section of ALECTOROMORPHÆ established the year after (*op. cit.* 1868, p. 296), composed of the CURASSOWS and MEGAPODES, being so called from the Pigeon-like structure of their feet, in which the hallux is long and on a level with the other toes, instead of being short and raised as in the other section, *Alectoropodes*, and it was a consideration of this difference that led to his important conclusions in regard to the GEOGRAPHICAL DISTRIBUTION of Mammals and Birds before mentioned (page 313).

PERITONEUM, a thin layer of connective tissue lining the whole of the body-cavity, and enveloping the viscera, as well as attaching the intestinal folds to each other and to the vertebral column as MESENTERY.

PETREL, the name applied in a general way to a group of Birds (of which more than 100 species are recognized) from the habit which some of them possess of apparently walking on the surface of the water as the apostle St. Peter (of whose name the word is a diminutive form) is recorded (Matt. xiv. 29) to have done. For a long while the Petrels were ranked as a Family, under the name of *Procellariidæ*,[2] and thought to be either very nearly allied to the *Laridæ* (GULL), or intermediate between that Family and the STEGANOPODES; but this opinion has gradually given way, and it is now hard to resist the conclusion that they have to be regarded as an "Order," to which the name TUBINARES has been applied from the tubular form of their nostrils, a feature possessed in greater or less degree by all of them, and one by which each may at a glance be recognized. They had been variously subdivided; but to little purpose until the anatomy of the group was subjected to comparative examination by Garrod and W. A. Forbes, the latter of whom summed up the results obtained by himself and his predecessor in an elaborate essay (forming part ix. of the *Zoology* of the voyage of the 'Challenger') which shewed determinations that differed greatly from any that had been reached by prior systematists. According to these investigators, the *Tubinares* are composed of two Families, *Procellariidæ* and *Oceanitidæ*, whose distinctness had hardly before been suspected[1]—the latter consisting of four genera not very much differing in appearance from many others, while the former includes as subfamilies *Diomedeinæ* (ALBATROS), with three genera, *Diomedea*, *Thalassiarche* and *Phœbetria*, and the true Petrels, *Procellariinæ*, in which last are combined forms so different externally and in habit as the Diving-Petrels, *Pelecanoides* or *Halodroma*, the Storm-Petrels, *Procellaria*, the Flat-billed Petrels, *Prion*, the FULMAR, the SHEARWATERS and others. Want of space forbids us here dwelling on the characters assigned to these different groups, or the means which have led to this classification of it, set forth at great length in the essay cited where also will be found copious references to previous studies of the Petrels.[2]

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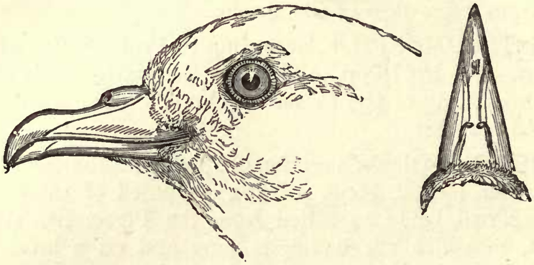
[1] The generic and specific distribution of the Penguins is the subject of an excellent essay by Prof. Alphonse Milne-Edwards in the *Annales des Sciences Naturelles* for 1880 (vol. ix. art. 9, pp. 23-81), of which there is a German translation in the *Mittheilungen* of the Ornithological Union of Vienna for 1883 (pp. 179-186, 210-222, 238-241).

[2] Most commonly but erroneously spelt *Procellaridæ*.



PETREL, *Prion turtur*. (After Buller.)

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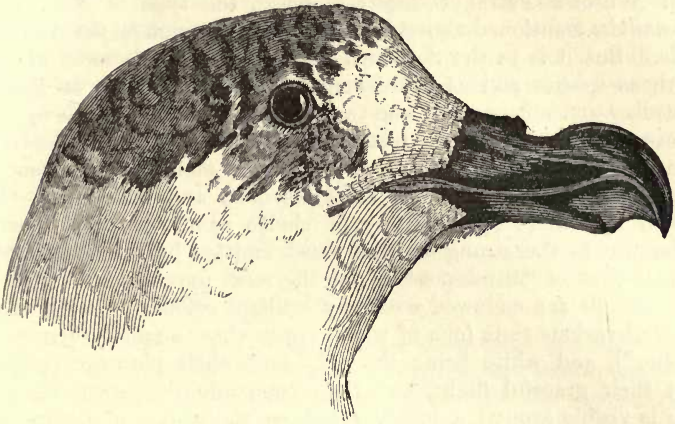
[1] It is due to Prof. Coues to state that in 1864 he had declared the genus *Oceanites*, of which he only knew the external characters, to be "the most distinct and remarkable" of the "*Procellarieæ*," though he never thought of making it the type of a separate Family.

[2] Among these may here be especially mentioned those of Quoy and Gaimard (*Ann. Sc. Nat.* v. pp. 123-155, and *Voy. de l'Uranie et la Physicienne, Zool.* pp. 142-169); Jacquinot (*Comptes Rendus*, 1844, pp. 353-358, and *Zool. Voy. au Pol Sud*, iii. pp. 128-152); Prof. Coues (*Proc. Acad. Philad.* 1864, pp. 72-91, 116-144, and 1866, pp. 25-33, 134-197); Mr. Salvin (*Orn. Miscell.* ii. pp. 223-238,

Petrels are dispersed throughout all the seas and oceans of the world, and some species apparently never resort to land except for the purpose of nidification, though nearly all are liable at times to be driven ashore, and often very far inland, by gales of wind.[1] Wanderers as they may be, there is reason to think that attachment to their home is a feeling as strong with them as with other birds, and it is only now beginning to be clear that until we know the breeding-place or places of each species—and some seem to be extremely restricted in this respect—we shall know very little to the point about their geographical distribution. But this knowledge is not easily obtained, for during the breeding-season many of these birds are almost wholly nocturnal in their habits, passing the day in holes of the ground, or in clefts of the rocks, in which they generally nestle, the hen of each pair laying a single white egg, sparsely speckled in a few species with fine reddish dots. Of those species that frequent the North Atlantic, the common Storm-Petrel, *Procellaria pelagica*, a little bird which has to the ordinary eye rather the look of a Swift or Swallow, is the "Mother Carey's chicken" of



CAPPED PETREL, *Œstrelata hæsitata*. (From *The Zoologist*, vol. x. p. 3693.)

249-257; and *Zoology*, *Voy.* '*Challenger*,' pt. viii. pp. 140-149); and the distribution of the group in the Southern Ocean is treated by Prof. A. Milne-Edwards (*Ann. Sc. Nat.* 1882, *Zool.* ser. 6, xiii. art. 4; Germanicè, *Mitth. Ornith. Ver. in Wien*, 1884).

[1] Thus *Œstrelata hæsitata*, the Capped Petrel, a species whose proper home seems to have been in Guadeloupe and Dominica (where it was known as the "Diablotin"), has even occurred in the State of New York, near Boulogne, in Norfolk and in Hungary (*Ibis*, 1884, p. 202)! But there is reason to fear that this species is nearly extinct, though an example is recorded (*Auk*, 1893, p. 361) in Virginia, some 200 miles from the sea, in August 1893, two days after a great storm, while its congener, *Œ. jamaicensis*, runs a risk of the same fate (see EXTERMINATION, p. 227, note 4).

sailors, and is widely believed to be the harbinger of bad weather; but seamen hardly discriminate between this and others nearly resembling it in appearance, such as Leach's or the Fork-tailed Petrel, *Cymochorea leucorrhoa*, a rather larger but less common bird, and Wilson's Petrel, *Oceanites oceanicus*, the type of the Family *Oceanitidæ* mentioned above, which is more common on the American side. But it is in the Southern Ocean that Petrels most abound, both as species and as individuals. The Cape-Pigeon or Pintado Petrel, *Daption capensis*, is one that has long been well known, while those who voyage to or from Australia, whatever be the route they take, are certain to meet with many more species, some, as *Ossifraga gigantea*, as large as Albatroses, and several of them called by sailors by a variety of choice names, generally having reference to the strong smell of musk emitted by the birds, among which that of "Stink-pot" is not the most opprobrious. None of the Petrels are endowed with any brilliant colouring—sooty-black, grey of various tints (one of which approaches to and is often called "blue"), and white being the only hues their plumage exhibits; but their graceful flight, and their companionship when no other life is visible around a lonely vessel on the widest of oceans, give them an interest to beholders, though this is too often marred by the wanton destruction dealt out by brutal or thoughtless persons who thus seek to break the tediousness of a long voyage.

PETTICHAPS, the name under which a bird, supposed to be that now commonly known as the Garden-WARBLER, *Sylvia salicaria* or *hortensis*, was sent from Yorkshire by Jessop to Willughby (*Ornithologia*, p. 158), and hence more or less frequently applied to that species; or, with the qualification of "Lesser," to the CHIFF-CHAFF. The name was known in Lancashire a century later (Latham, *Gen. Synops.* ii. p. 413), but seems never to have been in general use in England. In 1873 the present writer obtained evidence (Yarrell, *Br. B.* ed. 4, i. p. 415) that it had not become obsolete near Sheffield where Jessop lived. It is also given as the name of a bird by Clare the Northamptonshire poet.

PEWEE, so called from its drawling note,[1] a well-known North-American bird, *Contopus virens*, one of the *Tyrannidæ* (TYRANT-BIRD), extremely abundant in the eastern side of the continent, and represented by other species in the remainder of it.

PEWIT, anciently *Puet*, the ordinary name of what is called in books the Black-headed GULL, *Larus ridibundus*, in the inland localities affected by it for breeding. The great Pewit-pool at Norbury in Staffordshire visited by Ray and Willughby, 14th May 1662, and well known from Plot's description (*Hist. Staffordsh.* pl. xix. pp. 231-233) had ceased to be occupied by the end of the last century, and most of the other stations throughout the country have been destroyed, some through drainage, but often by carelessness and occasionally by greediness—for the eggs are a valuable commodity, even as the young in old days were accounted[1]—but there are still two of considerable size in England, Scoulton in Norfolk, and Twigmoor in Lincolnshire. The name Pewit, in Scotland Peaseweep, is now more commonly applied to the LAPWING, but in each case it was given from the bird's cry, as it is in North America to one of the TYRANT-BIRDS, *Sayornis fusca*, which is a general favourite there as a recognized harbinger of summer.[2] To some ears its note sounds like "phebe," and as the "PHŒBE-bird"[3] it was first described by Pennant. In certain districts it bears the name of "Bee-eater," to which it is very likely entitled, and there it is not very popular with the owners of hives.

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[1] This is said to be in sharp contrast with that of its relative called in North America the PEWIT.

PHALANGES, the several bones composing the digits. In those of the hind limb (or TOES) the original and almost universal number is 2 for the HALLUX, and 3, 4 and 5 for the second, third and fourth digits respectively. Exceptions are found in *Cypselus* and *Panyptila* (SWIFT), where the second, third and fourth toes have each 3 phalanges, in some of the *Caprimulgi* (NIGHTJAR), and in the singular genus *Cholornis* from Western China and of doubtful affinity, where the fourth digit is reduced to a mere stump. Of the wing-digits the POLLEX has 2 phalanges, the index 2 or 3, and the third 1 or 2—the terminal phalanges being often very small or represented by cartilage only.

PHALAROPE, Brisson's maladroit rendering[4] of the "Coot-footed Tringa" of Edwards who, in 1741, shewed himself a better judge of its affinities than many others both before and after him, since for a long while some of the best authorities thought the Phalaropes allied to the COOT, whereas they are unquestionably *Limicolæ*, only somewhat modified in accordance with their habit of swimming. There are three species, each possessing a peculiarity of structure sufficient to warrant its being regarded as generic were the doing so convenient. The type is *Phalaropus fulicarius*, commonly known in England as the Grey Phalarope, from the prevalent colour of its winter-plumage, which it has generally donned when it visits this country, as it does almost every year.[1] It wears a very different aspect in summer, when the whole of the lower parts are bright bay, while the feathers above are dark brown broadly edged with light rusty, and hence it has in this condition been called the Red Phalarope. It is known to breed in Spitsbergen, in one part at least of Iceland, in Greenland, and presumably throughout Arctic America and Asia, but not on the continent of Europe. Its wanderings in winter seem to be boundless, since its appearance is recorded in Chili and in New Zealand. The next species, known as the Red-necked Phalarope, *P.* or *Lobipes hyperboreus*, is truly a British bird, breeding in a few spots (which are best not named) in Scotland and its islands. Of more slender form, its plumage is comparatively plain, but the bay patch on the side of the neck contrasts with the white chin to give it a conspicuous appearance. It does not range northward so far as the last, but it is found breeding in Scandinavia, Russia, Siberia and America—from Alaska to Labrador, as well as in Greenland, while in winter it would seem not to stray quite so far to the south. The third species, *P.* or *Steganopus tricolor* or *wilsoni*, of still more slender form, has a very restricted breeding-range in North America, not being recorded from the Pacific slope and being rare on the Atlantic coast. In winter, however, it reaches Patagonia. Did space allow, the various qualities of this beautiful group of birds would be willingly dwelt upon here. A more entrancing sight to the ornithologist can hardly be presented than by either of the two species first named. Their graceful form, their lively coloration, and the confidence with which both are familiarly displayed in their breeding-quarters can hardly be exaggerated, and it is equally a delightful sight to watch these birds gathering their food in the high-running surf, or when that is done peacefully floating outside the breakers. The nest, which the male—for in the Phalaropes, as in the DOTTEREL and the GODWITS, that sex undertakes the duty of incubation—leaves only to escape being trodden upon, is in itself a picture that the finder will recall with rapture, while the tameness of the birds tempts the observer to watch their ways by the hour, be the weather never so bad[2] (see SANDPIPER).

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[1] They were netted before they could fly, and kept in pens to be killed for the table as wanted, selling in Ray's time for five shillings the dozen.

[2] Not to be confounded with the PEWEE.

[3] This name is usually so spelt, but it has nothing to do with the moon-goddess or any one named after her.

[4] His generic term should have been *Phalaridopus* from φαλαρίς, -ίδος (*cf.* Murdoch, *Bull. Nutt. Orn. Club*, iii. p. 150).

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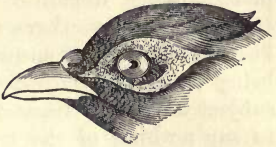
[1] In numbers it is very variable. In the autumn of 1866, more than 500 were recorded as observed and mostly shot in Britain, according to the *Summary* which Mr. J. H. Gurney, junior, was at the pains to compile and publish in 1867.

[2] Here may be noticed the "Barred Phalarope," described in 1785 by Latham (*Gen. Synops.* iii. p. 274) from a specimen in Banks's collection obtained at Christmas Island on Cook's Third Voyage, the *Tringa cancellata* of Gmelin. It seems not to have been a Phalarope at all, and in 1859 G. R. Gray (*Cat. B. Isl. Pacif.* p. 51) referred to it the *T. parvirostris* described and figured by Peale as found in July 1839, by the United States' Expedition under Wilkes, abundantly on some of the Paumotu Islands, where it was breeding and exceedingly tame. In 1874 Prof. Coues (*B. North-West*, p. 506) established for it the genus *Æch-*

PHEASANT, Mid.-Eng. *Fesaunt* and *Fesaun*, Germ. *Fasan* and anciently *Fasant*, Fr. *Faisan*—all from the Latin *Phasianus* or *Phasiana* (*sc. avis*), the Bird brought from the banks of the river Phasis, now the Rioni, in Colchis, where it is still abundant, and introduced by the Argonauts, it is said in what passes for history, into Europe. As a matter of fact nothing is known on this point; and, judging from the recognition of the remains of several species referred to the genus *Phasianus* both in Greece and in France,[1] it seems not impossible that the ordinary Pheasant, the *P. colchicus* of ornithologists, may have been indigenous to this quarter of the globe. If it was introduced into England, it must almost certainly have been brought hither by the Romans; for, setting aside several earlier records of doubtful authority,[2] Bishop Stubbs has shewn that by the regulations of King Harold in 1059 "*unus phasianus*" is prescribed as the alternative of two Partridges or other birds among the "pitantiæ" (rations or commons, as we might now say) of the canons of Waltham Abbey, and, as Prof. Dawkins has remarked (*Ibis*, 1869, p. 358), neither Anglo-Saxons nor Danes were likely to have introduced it into England. It seems to have been early under legal protection, for, according to Dugdale, a licence was granted in the reign of



PHEASANT. (After Swainson.)

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morhynchus. Mr. Seebohm (*Charadriidæ*, p. 451, pl. xvii.) refers it to the genus *Phegornis*, with which it seems to have little in common; but makes some amends by giving a good figure of it. The only specimens now known to exist appear to be those at Washington, and there is good reason to fear that the species may be extinct—the victim, most likely, of rats or other predacious animals that have found their way to its very confined haunt—a case parallel perhaps to that of *Prosobonia leucoptera* of Tahiti (see SANDPIPER).

[1] These are *P. archiaci* from Pikermi, *P. altus* and *P. medius* from the lacustrine beds of Sansan, and *P. desnoyersi* from Touraine (A. Milne-Edwards, *Ois. foss. de la France*, ii. pp. 229, 239-243).

[2] Among these perhaps the most worthy of attention is in Probert's translation of *The Ancient Laws of Cambria* (ed. 1823, pp. 367, 368), wherein extracts are given from Welsh triads, presumably of the age of Howel the Good, who died in 948. One of them is "There are three barking hunts: a bear, a squirrel, and a pheasant." The explanation is "A pheasant is called a barking hunt, because when the pointers come upon it, and chase it, it takes to a tree, where it is hunted by baiting." I have not been able to trace the manuscript containing these remarkable statements so as to find out what is the original word rendered "Pheasant" by the translator; but a reference to what is probably the same passage with the same meaning is given by Ray (*Synops. Meth. Animal.* pp. 213, 214) on the authority of Llwyd or Lloyd, though there is no mention of it in Wotton and Clarke's *Leges Wallicæ* (1730). A charter (Kemble, *Cod. Diplom.* iv. p. 236), professedly of Edward the Confessor, granting the wardenship of certain forests in Essex to Ralph Peperking, speaks of "fesant hen" and "fesant cocke," but is now known to be spurious.

Henry I. to the Abbot of Amesbury to kill Hares and Pheasants, and from the price at which the latter are reckoned, in various documents that have come down to us, we may conclude that they were not very abundant for some centuries, and also that they were occasionally artificially reared and fattened, as appears from Upton,[1] who wrote about the middle of the 15th century, while Henry VIII. seems from his privy purse expenses to have had in his household in 1532 a French priest as a regular "fesaunt breder," and in the accounts of the Kytsons of Hengrave in Suffolk for 1607 mention is made of wheat to feed Pheasants, Partridges and Quails.

Within recent years the practice of bringing up Pheasants by hand has been extensively followed, and the numbers so reared vastly exceed those that are bred at large. The eggs are collected from birds that are either running wild or kept in a mew,[2] and are placed under domestic Hens; but, though these prove most attentive foster-mothers, much additional care on the part of their keepers is needed to ensure the arrival at maturity of the poults; for, being necessarily crowded in a comparatively small space, they are subject to several diseases which often carry off a large proportion, to say nothing of the risk they run by not being provided with proper food, or by meeting an early death from various predatory animals attracted by the assemblage of so many helpless victims. As they advance in age the young Pheasants readily take to a wild life, and indeed can only be kept from wandering in every direction by being plentifully supplied with food, which has to be scattered for them in the coverts in which it is desired that they should stay. Of the proportion of Pheasants artificially bred that "come to the gun" when the shooting-season arrives it is impossible to form any estimate, for it would seem to vary enormously, not only irregularly according to the weather, but regularly according to the district. In the eastern counties of England, and some other favourable localities, perhaps three-fourths of those that are hatched may be satisfactorily accounted for; but in many of the western counties, though they are the objects of equally unremitting or even greater care, it would seem that more than half of the number that live to grow their feathers disappear inexplicably before the coverts are beaten. The various effects of the modern system of Pheasant-breeding and Pheasant-shooting need here be treated but briefly. It is commonly condemned as giving encouragement to poaching, and, especially under ignorant management, as substituting slaughter for sport. Undoubtedly there is much to be said on this score; but in reply to the first objection it has been urged that as a rule the poacher does not like visiting coverts that he knows to be effectively preserved, and that coverts containing a great stock of Pheasants, whose rearing has cost a considerable sum of money, are probably the most effectively preserved. As to the second objection, it is to be observed that what constitutes sport is in great measure a matter of individual taste, and that the reasonable limit of a sportsman's "bag" is practically an unknown quantity. One man likes shooting a Pheasant rising at his feet or sprung by his spaniels, as it flies away from him through the trees and is still labouring to attain its full speed; another prefers shooting one that has mounted to its greatest height, and, assisted perhaps by the wind, is traversing the sky at a pace that almost passes calculation. If skill has to be considered in the definition of sport, there can be no doubt as to which of these cases most requires it. In regard to cruelty—that is, the proportion of birds wounded to those killed—there seems to be little difference, for the temptation to take "long shots" is about equal in either case. The Pheasant whose wing is broken by the charge, if at a great height, is often killed outright by the fall, whereas, if nearer the ground, it will often make good its escape by running, possibly to recover, or more possibly to die after lingering in pain for a longer or shorter time. On the other hand, high-flying Pheasants, having their vital parts more exposed, are often hit in the body, but not hard enough to bring them down, though the wound they have received proves mortal, and the velocity at which they are travelling takes them beyond reach of retrieval.

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[1] In his *De studio militari* (not printed till 1654) he states (p. 195) that the Pheasant was brought from the East by "Palladius ancorista."

[2] In 1883, 134,000 Pheasants' eggs were sold from one estate in Suffolk, and 101,000 in 1893, while 9700 birds were killed upon it.

Formerly Pheasants were taken in snares or nets, and by hawking; but the crossbow was also used, and the better to obtain a "sitting shot," for with that weapon men had not learnt to "shoot flying"; dogs appear to have been employed in the way indicated by the lines under an engraving by Hollar, who died in 1677:—

"The Feasant Cocke the woods doth most frequent,
Where Spaniells spring and pearche him by the sent."[1]

The use of firearms has put an end to the older practices, and the gun is now the only mode of taking Pheasants recognized as legitimate.

Of the many other species or local races of *Phasianus*, two only can be dwelt upon here. These are the Ring-necked Pheasant of China, *P. torquatus*, easily known by the broad white collar, whence it has its name, as well as by the pale greyish-blue of its upper wing-coverts and the light buff of its flanks, and the *P. versicolor* of Japan, often called the Green Pheasant from the beautiful tinge of that colour that in certain lights pervades almost the whole of its plumage, and, deepening into dark emerald, occupies all the breast and lower surface that in the common and Chinese birds is bay barred with glossy black scallops. Both of these species have been to a considerable extent introduced into England, and cross freely with *P. colchicus*, while the hybrids of each with the older inhabitants of the woods are not only perfectly fertile *inter se*, but cross as freely with the other hybrids, so that birds are frequently found in which the blood of the three species is mingled. The hybrids of the first cross are generally larger than either of their parents, but the superiority of size does not seem to be maintained by their descendants. White and pied varieties of the common Pheasant, as of most birds, often occur, and with a little care a race or breed of each can be perpetuated. A much rarer variety is sometimes seen; this is known as the Bohemian Pheasant, not that there is the least reason to suppose it has any right to such an epithet, for it appears, as it were, accidentally among a stock of the pure *P. colchicus*, and offers an example analogous to that of the "japanned" PEACOCK already noticed, being, like that breed, capable of perpetuation by selection. To a small extent two other species of Pheasant have been introduced to the coverts of England—*P. reevesi* from China, remarkable for its very long tail, white with black bars,[1] and the Copper Pheasant, *P. sœmmerringi*, from Japan. The well-known Gold and Silver Pheasants, *Thaumalea picta* and *Euplocamus nycthemerus*, are both from China and have long been introduced into Europe, but are only fitted for the aviary. To the former is allied the still more beautiful *T. amherstiæ* and to the latter about a dozen more species, most of them known to Indian sportsmen by the general name of KALLEGE. These with the comparatively plain PUKRAS, *Pucrasia*, the magnificent MONALS, *Lophophorus*, are elsewhere treated, but the fine Snow-Pheasants, *Crossoptilum*, of which there are several species, must, for want of space, be only mentioned here. All the species known at the time were beautifully figured from drawings by Mr. Wolf in Mr. Elliot's grand *Monograph of the Phasianidæ* (2 vols. fol. 1870-72)—the last term being used in a somewhat general sense. With a more precise scope Mr. Tegetmeier's *Pheasants: their Natural History and Practical Management* (4to, ed. 2, 1881) is to be commended as a very useful work.

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[1] Quoted by the writer (Broderip?) of the article "Spaniel" in the *Penny Cyclopædia*. The lines throw light on the asserted Welsh practice mentioned in a former note.

PHILIP and PHILP, old nicknames for the SPARROW (see page 132, note 1).

PHŒBE, in parts of North America a name for what is there called also the PEWIT, *Sayornis fusca*, one of the TYRANT-BIRDS.

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[1] The introduction of this species by the first Lord Tweedmouth near Guisachan in Inverness-shire is said to have been remarkably successful.

PHŒNIX, said by Hesiod (*apud Plin. H. N.* vii. 49) to be a bird that lived nine times as long as a Crow; and, in a passage too often quoted to need repetition, described by Herodotus (*Euterpe*, 73) from a picture which he saw in Egypt. To doubt the existence of this bird was for ages evidence of depravity, for it had been so entwined by Classical, Rabbinical, Christian and Mahomedan legend, and so used to illustrate the sublimest doctrine, that we may almost wonder at belief in it not being enjoined by some confession of faith or imported into some religious formulary. Moreover though no Greek, Latin or Arabic author[1] could vouch for having himself seen a specimen, and its last appearance on earth was said to be in the consulship of Paulus Fabius and Lucius Vitellius (*i.e.* A.D. 34), as stated by Tacitus (*Ann.* vi. 28), yet according to Camden (*Britannia*, p. 783, ed. 1607) one of its feathers was sent in 1599 by Pope Clement VIII. to the celebrated Hugh O'Neal, Earl of Tyrone, then leader of the Irish opposition; and the writer of the article "Phœnix" in the *Penny Cyclopædia* (xviii. pp. 101-103) declared that even in June 1840, a very learned scholar at Oxford, subsequently stated (*Notes and Queries*, ser. 7, vi. pp. 481, 482) to have been Mr. J. B. Morris of Exeter College, still seriously believed in the existence of the bird. It was long ago suggested by Sir Thomas Browne (*Vulgar Errors*, book III. chap. xii.) that the Phœnix-story had its origin in a Bird-of-Paradise (p. 38, note 3), and unless the whole was a lie from the beginning this still seems possible; but the late Mr. Gurney used to consider that a "Bateleur" Eagle (*Helotarsus ecaudatus*) was the cause of it.[2]

PICÆ, the second Order of Birds in the Linnæan system, composed of the genera *Psittacus* (Parrot), *Ramphastos* (Toucan), *Buceros* (Hornbill), *Buphaga* (Oxpecker), *Crotophaga* (Ani), *Corvus* (Crow), *Coracias* (Roller), *Oriolus* (Oriole), *Gracula* (Grackle), *Paradisea* (Bird-of-Paradise), *Trogon* (Trogon), *Bucco* (Barbet), *Cuculus* (Cuckow), *Yunx*[3] (Wryneck), *Picus* (Woodpecker),

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[1] It was defined by Arabic writers to be a creature "whose name was known, its body unknown."

[2] The literature of the subject is not without interest and very large, though (possibly through the lack of specimens) it has fallen off of late years. Among separate works the following may be named:—Dauderstadius, *Disput. de Phœnice* (Lipsiæ: 1665); Kirschmaier and Oheimb, *De Phœnice* (Wittembergæ: 1660); Kirschmaier, *Disputt. zooll. de Basilisco, Unicornu, Phœnice* &c. (Wittemb. 1661; Jenæ: 1760); Lagerlöff, *Phœnicis μυθολογία* (Upsaliæ: 1689); Mennander, *Dissert. de Phœnice Ave* (Aboæ: 1748); Pfeiffer, *Dissert. de Phœnice Ave* (Regiomonti: 1673); Seuberlich, *De Phœnice* (Regiom. 1696); Wendler, *Dissert. de Phœnice* (Geræ: 1687); but the above-named article in the *Penny Cyclopædia*, by the late Dr. Greenhill, is especially good.

[3] In the preceding edition of the *Systema Naturæ* more correctly spelt *Jynx*, which is the continental way of printing our *Iynx*.

Sitta (NUTHATCH), *Todus* (TODY), *Alcedo* (KINGFISHER), *Merops* (BEE-EATER), *Upupa* (HOOPOE), *Certhia* (TREE-CREEPER), *Trochilus* (HUMMING-BIRD). Of this multifarious assembly the 4th, 6th, 8th, 9th, 10th, 16th and 21st are now almost unanimously referred to the Order PASSERES, while the disposition of the rest cannot be accounted fixed, though, except the 1st, they are referred in this book to

PICARIÆ, a group of Birds, so named by Nitzsch in 1820 (*Deutsches Arch. für Physiol.* vi. p. 255) to include the genera *Coracias*, *Upupa*, *Alcedo*, *Cuculus*, *Psittacus*, *Picus*, *Yunx*, *Caprimulgus* and *Cypselus*: opposed to his PASSERINÆ, but not to be confounded with

PICARII, Johannes Müller's name (*Abhandl. Akad. Berlin*, 1845, p. 383) for what he separated as the third Tribe of his great Order INSESSORES or PASSERINI (the other two being OSCINES and TRACHEOPHONES) comprehending the *Ampelidæ*[1] and *Tyrannidæ* in addition to those included, actually or consequentially, in Nitzsch's PICARIÆ.

PICI, the name of an Order of Birds proposed in 1810 by Meyer and Wolf (*Taschenb. deutsch. Vögelkunde*, i. p. 115) to include the genera *Picus*, *Yunx*, *Sitta*, *Certhia*, *Merops* and *Alcedo*, the 3rd and 4th of which are truly Passerine. Such modern systematists as retain the term limit it to the WOODPECKERS and WRYNECKS.

PICKCHEESE, a common local name of the Blue TITMOUSE.

PICKET and PICKTARN, local names for the Common TERN.

PICKMIRE, a local name for the PEWIT or Black-headed GULL.

PICUCULE,[2] a name given, without reason says Buffon (*H. N. Ois.* vii. p. 82, note), to a bird figured by D'Aubenton (*Pl. enl.* 621)—the *Dendrocolaptes certhia* or *cayennensis* of later writers—continued by Vieillot in 1816 (*Analyse*, p. 45), and retained in 1820 by Temminck (*Man. d'Orn.* ed. 2, i. p. lxxxi.) in a generic sense, while it was used as English in Griffith's translation of Cuvier's *Animal Kingdom* in 1829 (ii. p. 350), and is here adopted for want of a better,[3] as that of the large Family of TRACHEOPHONÆ,

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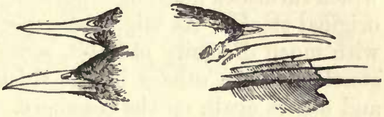
[1] Meaning what are more correctly called *Cotingidæ* (CHATTERER).

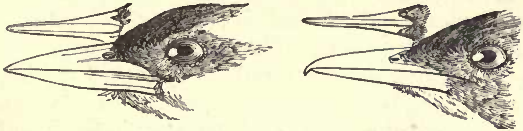
[2] Accidentally misspelt (*Encyclop. Brit.* ed. 9, iii. p. 743 and perhaps elsewhere) "Piculule." It would seem that the inventor coined the word as a combination of *Picus* and *Cuculus*. Buffon used "*Pic-grimpereau*," which is just as misleading.

[3] Mr. Hudson, who (*Argent. Orn.* i. pp. 165-202) tells more of the habits of the birds of this Family than perhaps any other writer, uses for them collectively the name "Woodhewer," which seems unhappily applied, as no species appears able to hew wood, and the word is hardly an accurate rendering of *Dendrocolaptes*.

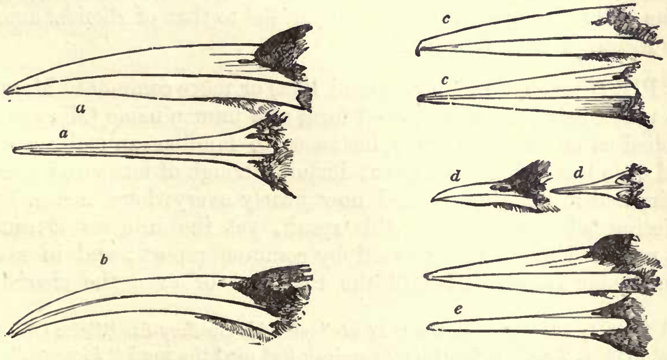
Dendrocolaptidæ, which is so highly characteristic of the Neotropical Region. Not one of them was known to Linnæus, and for many years very erroneous notions were entertained as to their systematic position. They are mostly small birds of dull appearance, brown being their prevalent hue, with stiff and often sharply-pointed rectrices—a character which led the earlier writers to associate them with the Pici or the *Certhiidæ* (Tree-Creeper), and their entire difference from both those groups was not admitted until shewn by Johannes Müller. Mr. Sclater (*Cat. B. Br. Mus.* xv. pp. 2-175) groups them in 5 subfamilies, the first of which, *Furnariinæ*, has been already mentioned in these pages (Oven-bird), while the next three, *Synallaxinæ* (with 8 genera, including *Synallaxis* and the curious form *Oxyurus*), *Philydorinæ* (with 17 genera, including *Anabatoides* and *Philydor*) and *Sclerurinæ* call for no particular remark here. The last and most typical subfamily *Dendrocolaptinæ* has, according to the authority just named, 15 genera (among which are *Dendrocolaptes* proper and its section *Dendrocops*, *Xiphorhynchus*, *Sittasomus* and *Dendroplex*) and some 80 species. Indeed there is no need here to dwell upon them more than to point out their importance in the Fauna of Southern tropical America. Though now ranging all over the Neotropical Region,



Synallaxis. Oxyurus.
(After Swainson.)



Anabatoides. Philydor.
(After Swainson.)



a, Dendrocolaptes; *b*, Xiphorhynchus; *c*, Dendrocops; *d*, Sittasomus; *e*, Dendroplex.
(After Swainson.)

the Antillean Subregion excepted, and even extending into Mexico, which according to most zoo-geographers is "Nearctic,"—while the number of forms inhabiting the tropical portion is vastly greater than that of those now existing within "Patagonian" limits, however liberally the last may be regarded,—this Family will very likely prove eventually to belong to the more ancient population of the continent. These forms are essentially of identical nature, but exhibit many and some extreme modifications of structure, a fact which furnishes a strong argument in favour of the antiquity of the original stock. As might be expected, their differences correspond with much diversity of habit, some of the forms living on the most sterile uplands, others in the thickest forests, others in reed-beds and others again on the sea-shore.

PICULET, the name apparently first assigned in 1845 by G. R. Gray[1] (*Gen. B.* ii. p. 432) to birds of the subfamily *Picumninæ*, composed according to Mr. Hargitt (*Cat. B. Br. Mus.* xviii. pp. 8, 521-559) of 4 genera—*Picumnus* with 33 species, of which 31 are Neotropical and 2 Indian; *Nesoctites* with a single species peculiar to Hispaniola; *Verreauxia*, also with one species, confined to the Gaboon country; and *Sasia*, with 3 species, ranging from Nepal through the Malay peninsula to Borneo. They are all of small size and thorough WOODPECKERS in habit and appearance, but having the tail short, soft and rounded. The geographical distribution of the whole subfamily, and especially of *Picumnus* proper, as above stated, points to its antiquity, and interest in the group is enhanced by the fact that *Sasia* has got rid of its hallux, thus affording a case parallel to that of *Picoides* among the *Picinæ* or true Woodpeckers.

PIE (French, *Pie*,[2] in Scotland Piet) or more commonly Magpie, the prefix being the abbreviated form of a human name (Margaret[3]) applied as in so many other instances to familiar animals, as this bird once was throughout Great Britain, though of late years almost extirpated in many parts, and now nearly everywhere scarce. Its pilfering habits have led to this result, yet the injuries it causes are unquestionably exaggerated by common report; and in many countries of Europe it is still the tolerated or even the cherished neighbour of every farmer, as it formerly was in England if not in Scotland also. Though now common enough in Ireland, there is ample evidence[1] to prove that it did not exist in that country in 1617, when Fynes Morison[2] wrote his *Itinerary*, and that adduced by Mr. Barrett-Hamilton (*Zool.* 1891, pp. 247-249) shews that it first appeared about 1676, when "a parcel," supposed to have been driven from Wales by stormy weather, landed in Wexford. It is a species that when not molested is extending its range, as Wolley ascertained in Lapland, where within the last century it has been gradually pushing its way along the coast and into the interior from one fishing-station or settler's house to the next, as the country has been peopled.

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[1] Possibly adapted from the "*Picule*" of Isid. Geoffroy-St. Hilaire (*N. Am. Mus.* 1832, p. 396). Before him Temminck had used the word "*Picumne.*"

[2] The "French Pie" of many parts of England is the Great-Spotted or Pied WOODPECKER of authors. When the Linnæan system came to be known in this country the word "Pie" was often used in a general sense as a rendering of PICÆ, the name of one of his Orders of Birds.

[3] "Magot" and "Madge," with the same origin, are names frequently given in England to the Pie; while in France it is commonly known as *Margot*, if not termed, as it is in some districts, *Jaquette*.

Since the persecution to which the Pie has been subjected in Great Britain, its habits have undoubtedly altered greatly in character. It is no longer the merry, saucy hanger-on of the homestead, as it was to writers of former days, who were constantly alluding to its disposition, but is become the suspicious thief, shunning the gaze of man, and knowing that danger may lurk in every bush. Hence opportunities of observing it fall to the lot of few, and most persons know it only as a curtailed captive in a wicker cage, where its vivacity and natural beauty are lessened or wholly lost. At large few European birds possess greater beauty, the pure white of its scapulars and inner web of the flight-feathers contrasting vividly with the deep glossy black of the rest of its body and wings, while its long tail is lustrous with green, bronze and purple reflexions. The Pie's nest is a wonderfully ingenious structure, whether placed in high trees or low bushes, and is so massively built that it will stand for years. Its foundation consists of stout sticks, turf and clay, wrought into a deep, hollow cup, plastered with earth, and lined with fibres; but around this is erected a firmly-interwoven, basket-like outwork of thorny twigs, forming a dome over the nest, and leaving but a single hole in the side for entrance and exit, so that the whole structure is rendered almost impregnable. Herein are laid from six to nine eggs, of a pale bluish-green freckled with brown and blotched with ash-colour. Superstition as to the appearance of the Pie still survives even among many educated persons, and there are several versions of a riming adage as to the various turns of luck which its presenting itself, either alone or in company with others, is supposed to betoken, for some of these versions contradict one another in details, though all agree in this that the sight of a single Pie unquestionably forebodes sorrow.

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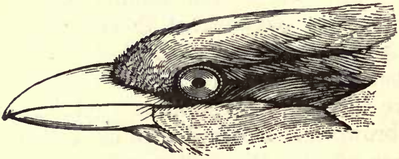
[1] A compendious summary of this will be found in Yarrell's *British Birds*, ed. 4, ii. pp. 318-320.

[2] His predecessor Derricke, in 1578, said:—

> "No Pies to plucke the Thatch from house,
> are breed in Irishe grounde:
> But worse then Pies, the same to burne,
> a thousande maie be founde."—*The Image of Irelande*, London: 1581.

The Pie belongs to the *Corvidæ* (Crow), and is the *Corvus pica* of Linnæus, the *Pica caudata*, *P. melanoleuca* or *P. rustica* of modern ornithologists, who have recognized it as forming a distinct genus, but the number of species thereto belonging has been a fruitful source of discussion. Examples from the south of Spain differ slightly from those inhabiting the rest of Europe, and in some points more resemble the *P. mauritanica* of north-western Africa; but that species has a patch of bare skin of a fine blue colour behind the eye, and much shorter wings. No fewer than five species have been discriminated from various parts of Asia, extending to Japan; but only one of them, the *P. leucoptera* of Turkestan and Tibet, has of late been admitted as valid. In the west of North America, from Alaska to New Mexico, as well as in some of its islands, a Pie is found which extends to the upper valleys of the Missouri and the Yellowstone, even appearing so far to the eastward as Cumberland House, in the Province of Winnipeg, and in the State of Michigan, and was long thought entitled to specific distinction as *P. hudsonia*; but its claim thereto is now disallowed by most American ornithologists, and it can hardly be deemed even a geographical variety of the Old-World form. In California, however, there is a permanent race if not a good species, *P. nuttalli*, easily distinguishable by its yellow bill and the bare yellow skin round its eyes; and it is a curious fact that on two occasions in the year 1867 a bird apparently similar was observed in Great Britain (*Zoologist*, ser. 2, pp. 706, 1016).[1]

More or less allied to the genus *Pica* are some forms that can hardly be separated from Jays, as for instance the species of *Cissa*, before mentioned (page 470), concerning the affinity of which opinions have differed much, but Mr. Oates (*Fauna Br. Ind. Birds*, i. p. 28), declares in favour of its Pie-like position. On the other hand *Dendrocitta* with several kindred genera, all belonging to the Indian Region, are with less doubt referred to the neighbourhood of *Pica*, as also is *Cyanopica*,[2]



Cissa. (After Swainson.)

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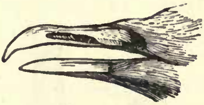
[1] Dr. Diederich (*Ornis*, 1889, pp. 280-332, tab. iv.) has treated at length and illustrated by a map the geographical distribution of the genus *Pica*.

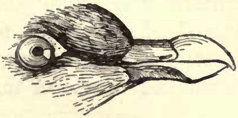
[2] Dr. Sharpe (*Cat. B. Br. Mus.* iii. p. 67), calls this genus *Cyanopolius*, citing as his authority a passage wherein that name does not occur. Bonaparte seems to have used it only in manuscript (see his *Consp. Av.* i. p. 282; and Waterhouse, *Index Generum Avium*, p. 59, note).

so remarkable for its discontinuous distribution, already noticed (p. 342)—one of its two species, *C. cooki*, being the Blue Pie of the Iberian Peninsula, and the other, *C. cyana*, that of Eastern Asia with Japan.

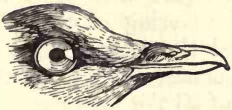


ECTOPISTES. (After Swainson.)

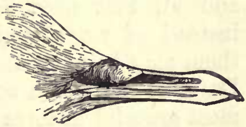
PIGEON, French *Pigeon*, Italian *Piccione* and *Pipione*, Latin *Pipio*, literally a nestling-bird that pipes or cries out, a "Piper"—the very name now in use among Pigeon-fanciers. The word Pigeon, doubtless of Norman introduction as a polite term, seems to bear much the same relation to DOVE, the word of Anglo-Saxon origin, that mutton has to sheep, beef to ox, veal to calf, and pork to bacon; but, as before stated (p. 162), no sharp distinction can be drawn between the two, and the collective members of the group *Columbæ* are by ornithologists ordinarily called Pigeons. Perhaps the best known species to which the latter name is exclusively given in common speech[1] is the Wild or PASSENGER-PIGEON of North America, *Ectopistes*, already mentioned; but among the multitudinous forms very few can here be noticed. A species which seems worthy of attention as being one that might possibly repay the trouble of domestication, if any enterprising person would give it the chance, is the Wonga-wonga or White-fleshed Pigeon of Australia, *Leucosarcia picata*, a bird larger than the Ring-Dove, of a slaty-blue colour above and white beneath, streaked on the flanks with black. It is known to breed, though not very freely, in captivity, and is said to be excellent for the table. As regards flavour, however, those who have been so fortunate as to eat them declare that the green Fruit-Pigeons of the genera *Treron* and *Vinago* and their allies surpass all birds. These inhabit tropical Africa, India, and especially the Malay Archipelago; but the probability of domesticating any of them is very remote. Hardly less esteemed are the Pigeons of the feather-legged genus *Ptilopus* and its kindred forms, which have their headquarters in the Pacific Islands, though some occur far to the westward, and also in Australia. Among them are found the most exquisitely-coloured of the whole Family, and the Fijian *Chrysœnas victor* with its glorious orange plumage especially



VINAGO.



PTILOPUS.
(After Swainson.)



PHAPS.

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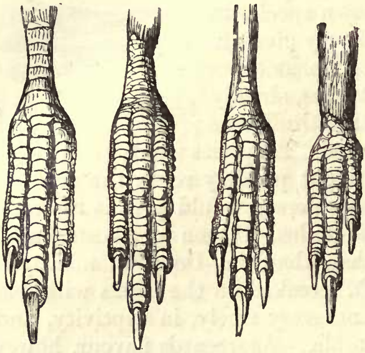
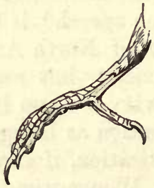
[1] It may be observed that the "Rock-Pigeons" of Anglo-Indians are SAND-GROUSE, and the "Cape Pigeon" of sailors is a PETREL.

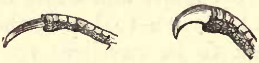
deserves attention, but the beautiful "Bronze-wings" of Australia, belonging to the genus *Phaps*, and some others are in their way hardly inferior. Then may be mentioned the strange Nicobar Pigeon, *Calœnas*, an inhabitant of the Indian archipelago, not less remarkable for the long lustrous hackles that clothe its neck than for the structure of its gizzard, which has been described by Sir W. Flower (*Proc. Zool. Soc.* 1860, p. 330), though this peculiarity is matched or even surpassed by that of the same organ in the *Phænorrhina goliath* of New Caledonia (*Rev. Zool.* 1862, p. 138) and in the *Carpophaga latrans* of Fiji, wherein the surface of the epithelial lining is beset by horny conical processes, adapted, it is believed, for crushing the very hard fruits of *Onocarpus vitiensis* on which the bird feeds (*Proc. Zool. Soc.* 1878, p. 102). The modern giants of the group, consisting of about half a dozen species of the genus GOURA and known as Crowned Pigeons have been already noticed, and all that need be added here is to mention the reticulated instead of scutellated covering of their "tarsi." In contrast to them may be mentioned the African *Œna capensis*, the "Namaqua Duif" of the Dutch colonists, which if not the smallest is one of the most graceful in form of all the *Columbæ*.



PIGEONS' FEET,
shewing amount of feathering of the "tarsus."
(After Swainson.)



FOOT OF ŒNA.



HALLUX OF
ENGYPTILA AND PTILOPUS.
(After Swainson.)

A very distinct type of Pigeon is that represented by *Didunculus strigirostris*, the "Manu-mea" of Samoa, absurdly called the DODLET, and still believed by some to be the next of kin to the DODO, though really presenting only a superficial resemblance in the shape of its bill to that effete form, from which it differs osteologically quite as much as do other Pigeons (*Phil. Trans.* 1869, p. 349). It remains to be seen whether the Papuan genus *Otidiphaps*, of which several species are now known, may not belong rather to the *Didunculidæ* than to the true *Columbidæ*.

At least 500 species of Pigeons have been described, and many methods of arranging them suggested. The most recent is that by Count T. Salvadori (*Cat. B. Brit. Mus.* xxi. London: 1893), but though elaborated with the usual skill of that careful worker, it cannot be deemed satisfactory since it is based only on some external characters, and of these the amount of feathering of the "tarsus," which is relied upon by a good many authors, receives but little notice. Perhaps, however, no other method is at present possible, for certainly the partial attempt of Garrod (*Proc. Zool. Soc.* 1874, pp. 249-259) was not very successful. The Count, rightly premising that "the Pigeons constitute a very homogeneous Order," divides it into two Suborders, *Columbæ* and *Didi*, asserting that the former of them "does not admit of division into easily definable or sharply defined groups" (but to this statement *Didunculus* proves a striking exception), recognizing it as composed of 5 Families, *Treronidæ* and *Columbidæ* with 3 subfamilies each; *Peristeridæ* with 7, and *Gouridæ* and *Didunculidæ*, each consisting of a single genus, and the last of a single species. Of genera he admits on the whole upwards of 60, to say nothing of subgenera, and it would be useless here to give even their names, since want of space forbids anything useful being said of them. The older works on the group, such as Temminck's folio (Paris: 1808-11), with its continuation (in 1838-43) by Florent Prévost, and Selby's more modest *Natural History of the Columbidæ* (1835) are of course out of date, and a new monograph of the Pigeons, containing all the recent discoveries, would be a desirable acquisition.

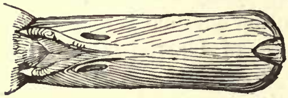
PILWILLET, one of the many names of the WILLET, *Symphemia semipalmata*, but also applied, according to Mr. Dresser (*Ibis*, 1886, p. 34), in Galveston Bay to the North-American OYSTER-CATCHER, *Hæmatopus palliatus.*

PIMLICO, one of the names given to the Australian FRIAR-BIRD.

PINC-PINC (or rather "Tinc-tinc"), the name which a South-African bird, *Drymœca* or *Cisticola textrix*, has given itself from its ringing metallic cry, often uttered as it hovers in the air (Layard, *B. S. Afr.* p. 85), and a species chiefly known to English readers from the often-repeated copy of Le Vaillant's figure (*Ois. d'Afr.* pl. 131) of a beautiful nest, which he wrongly assigned to it as its fabricator, the real builder of the wonderful structure being (Layard, *op. cit.* pp. 86, 114) the *Kapok vogel* (Cotton-bird), *Ægithalus capensis*, a near ally of *Æ. pendulinus*, the so-called Penduline TITMOUSE of Europe.

PINK, otherwise Spink, a well-known name of the CHAFFINCH.

PINTADO, a Portuguese word, meaning painted or mottled, commonly applied in some parts of England, and especially by some English writers, to the GUINEA-FOWL, but also by sailors to the so-called Cape-Pigeon, *Daption capensis* (PETREL).


BILL OF PINTAIL. (After Swainson.)

PINTAIL, properly the well-known DUCK, the male of which has the two middle tail-coverts very much elongated and pointed, the *Anas acuta* of Linnæus and *Dafila acuta* of modern writers, one of the most graceful and beautiful of the *Anatinæ* or so-called "fresh-water" Ducks, though not distinguished by the brilliance of its plumage. The drake has a brown head, whence a dark stripe runs down the nape, contrasting with the pure white of the throat and breast, which is continued upward along the side of the neck almost to the base of the skull. The upper parts generally are clothed with feathers marked with fine undulating bars of black and very light grey, so as to look as of a lavender-colour at a distance, against which the long and pointed scapulars, of a deep black with a broad edging of greyish-white, shew conspicuously: the blue-green speculum of the wing is bordered above by a rust-coloured and below by a white bar. The female is still more modestly clad, but the characteristic speculum and a somewhat elongated tail easily serve to her recognition. The Pintail is common to both areas of the Holarctic Region, and though not reaching its extreme circumpolar lands, breeds over most of the northern parts of both New and Old Worlds; but few unquestionable instances of its doing so in the British Islands, except as a captive, are known. Three other species of the genus *Dafila* exist, and they resemble *D. acuta* in the slenderness of their form, which extends even to the bill, and their pointed tail. Two belong to South America (*Proc. Zool. Soc.* 1876, pp. 392, 393), and the third is the "Red-billed Teal" of South Africa.

The name Pintail is applied in the colonies and elsewhere by English-speaking sportsmen to several other birds, as to one of the GROUSE of North America, *Pediocætes*, and to one of the SAND-GROUSE, *Pterocles setarius*.

PIPING CROW, see GYMNORHINA.

PIPIRI, one of several local names of *Tyrannus griseus* or *dominicensis*, a TYRANT that is widely spread throughout most parts of the West Indies.

PIPIT, French *Pipit*, cognate with the Latin *Pipio* (see PIGEON, p. 723), the name applied by ornithologists to a group of birds having a great resemblance both in habits and appearance to the LARKS, with which they were formerly confounded by systematists as they are at the present day in popular speech, but differing from them in several important characters; and, having been first separated to form the genus *Anthus*, which has since been much broken up, are now generally associated with the WAGTAILS in the Family *Motacillidæ*.[1] Pipits, of which over 30 species have been described (*cf.* Sharpe, *Cat. B. Br. Mus.* x. pp. 534-623), occur in almost all parts of the world, even New Zealand having its peculiar species, but in North America are represented by only two forms — *Neocorys spraguii*, the Prairie-Lark of the north-western plains, and *Anthus ludovicianus*, the American Titlark, which last is very nearly allied to the so-called Water-Pipit of Europe, *A. spipoletta.* To most English readers the best-known species of Pipit is the TITLARK or Meadow-Pipit, *A. pratensis*, a bird too common to need description, and abundant on pastures, moors and uncultivated districts generally; but in some localities the Tree-Pipit (to which the name Pipit seems properly to belong), the *A. trivialis*, or *A. arboreus* of some authors, takes its place, and where it does so it generally attracts attention by its loud song, which is not unlike that of a Canary-bird, but usually delivered (as is the habit of most or all the Pipits) on the wing and during a short circuitous flight. Another species, the Rock-Lark, *A. obscurus*, scarcely ever leaves the sea-coast and is found almost all round the British Islands. The South African genus *Macronyx* (KALKOENTJE), remarkable for the extreme length of its hind claw, is generally placed among the Pipits, but differs from all the rest in its brighter coloration, which has a curious resemblance to the American genus *Sturnella* (ICTERUS), though the bird is certainly not allied thereto.

PIRAMIDIG, a Creole name, according to Gosse (*B. Jamaica*, p. 33), of *Chordiles virginianus*, or more properly *C. minor* (NIGHTJAR), being an imitation of its cry uttered during its remarkable flight, which was minutely described by Osburn (*Zool.* 1860, pp. 6837-6841).

PIRENET, said to be a local name of the SHELD-DRAKE.

PIRREE, a name often given, from its cry, to a TERN.

PITTA, from the Telugu *Piṭṭa*, meaning a small Bird, latinized by Vieillot in 1816 (*Analyse*, p. 42) as the name of a genus, and since adopted by English ornithologists as the general name for a group of Birds, called by the French *Brêves*, and remarkable for their great beauty.[2] For a long while the Pittas were commonly supposed to be allied to the *Turdidæ*, and some English writers applied to them the names of "GROUND-THRUSHES" (page 388), "Water-Thrushes" and "ANT-THRUSHES" (page 20), to the first of which the group has some prescriptive right; but the second and third are misapplied since there is no evidence of their having aquatic habits, or of their preying especially upon ants. The fact that they had nothing to do with THRUSHES, but formed a separate Family, was gradually admitted. In 1847 Prof. Cabanis (*Arch. f. Naturg.* xiii. 2, i. p. 216) placed them under the CLAMATORES, and their position was at last determined by Garrod, who, having obtained examples for dissection, proved (*Proc. Zool. Soc.* 1876, pp. 512, 513) that the *Pittidæ* belonged to that section of Passerine Birds which he named MESOMYODI. This in itself was an unexpected determination, for all the other birds of the group, as then known, inhabit the New World, where no Pittas occur. But it is borne out by, and may even serve to explain, the sporadic distribution of the latter, which seems to indicate them to be survivors of a somewhat ancient and lower type of *Passeres.* Indeed except on some theory of this kind the distribution of the Pittas is almost inexplicable. They form a very homogeneous Family, most of its members bearing an unmistakable resemblance to each other—though the species inhabit countries so far apart as Angola and China, India and Australia; and, to judge from the little that has been recorded, they are all of terrestrial habit, while their power of flight, owing to their short wings, is feeble. In 1888 Mr. Sclater (*Cat. B. Br. Mus.* xiv. pp. 411-449) recognized 4 genera. They are *Anthocincla* with a single species from Tenasserim, remarkable for the tuft of elongated feathers on each side of its nape; *Pitta* with 43 species (to which by now more than one has to be added) of wide distribution; *Eucichla* with 5 species, all from the Indo-Malay countries; and "*Melampitta*" (Schlegel),[1] with a single species from New Guinea, which after all may not belong to the Family. Most of the true Pittas are from the Malay archipelago, between the eastern and western divisions of which they are pretty equally divided; and, in Mr. Wallace's opinion, they attain their maximum of beauty and variety in Borneo and Sumatra, from the latter of which islands comes the species, *Pitta elegans*, here represented. Few Birds can vie with the Pittas in brightly-contrasted coloration. Deep velvety black, pure white, and intensely vivid scarlet, turquoise-blue and beryl-green—mostly occupying a considerable extent of surface—are found in a great many of the species,—to say nothing of other composite or intermediate hues; and, though in some a modification of these tints is observable, there is scarcely a trace of any blending of shade, each patch of colour standing out distinctly. This is perhaps the more remarkable as the feathers have hardly any lustre to heighten the effect produced, and in some species the brightest colours are exhibited by the plumage of the lower parts of the body. Pittas vary in size from that of a Jay to that of a Lark, and generally have a strong bill, a thickset form, which is mounted on rather high legs with scutellated "tarsi," and a very short tail. In many of the forms there is little or no external difference between the sexes.[1]

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[1] Pipits can be distinguished from Larks by having the hind part of the "tarsus" undivided, while the Larks have it scutellated.

[2] In Ornithology the word is first found as part of the native name, "Ponnunky pitta" of a Bird, given in 1713 by Petiver, on the authority of Buckley, in the "Mantissa" to Ray's *Synopsis* (p. 195). This bird is the *Pitta bengalensis* of modern ornithologists, and is said by Jerdon (*B. Ind.* i. p. 503) now to bear the Telugu name of *Pona-inki*.

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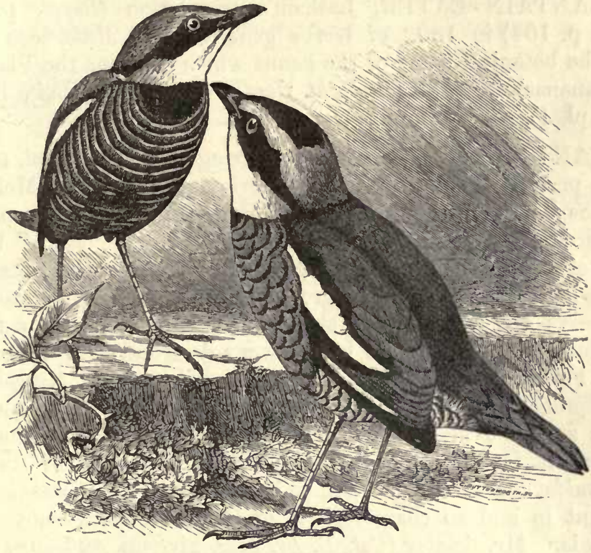
[1] Objection has been taken to this name, which is quite correct in form (witness *Melampus*), and *Mellopitta* (Stejneger, *Stand. Nat. Hist.* iv. p. 466), *Coracopitta* (Sclater, *ut supr.* p. 449) and *Coracocichla* (Sharpe, *op. cit.* xvii. p. 7) have been proposed in its stead.



PITTA ELEGANS, male and female. (After Schlegel.)

Placed by some authorities among the *Pittidæ* is the genus *Philepitta,* consisting of two species peculiar to Madagascar, while other systematists would consider it to form a distinct Family. This last was the conclusion, the propriety of which can hardly be questioned, arrived at by W. A. Forbes (*Proc. Zool. Soc.* 1880, pp. 387-391), from its syringeal characters, which, though shewing it to be allied to the Pittas, are yet sufficiently different to justify its separation as the type of a Family *Philepittidæ.* The two species which compose it have little outward resemblance to the Pittas, not having the same style of coloration and being apparently of more arboreal habits. The sexes differ greatly in plumage, and the males have the skin round the eyes bare of feathers and carunculated.[1]

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[1] All the species then known were figured in Mr. Elliot's *Monograph of the Pittidæ,* completed in 1863; but so many have since been described, that he is now bringing out a revised and enlarged edition of this work, as several of those lately discovered are figured only in Gould's *Birds of Asia* and *Birds of New Guinea.* Mr. Sclater's Catalogue above quoted will be found very useful.

PLANTAIN-EATER, Latham's translation (*Suppl. ii. Gen. Synops.* p. 104) in 1802 of Isert's generic name *Musophaga* (*Musa* being the botanical name of the genus which contains the Plantains and Bananas) in 1788 (*Beobacht. Gesellsch. naturf. Freunde*, iii. pp. 16-20, pl. 1), see TOURACO.

PLANT-CUTTER, Latham's rendering in 1802 (*Suppl. ii. Gen. Synops.* p. 212) of *Phytotoma*, the generic name given by Molina in 1782 (*Sagg. Stor. Nat. Chili*, p. 254; Eng. transl. 1809, i. p. 210) to a bird called, from its harsh and broken cry, "Rara" by the people of Chili, who bear it no goodwill from its habit of cutting off growing plants close to the ground with its strongly-serrated bill, often, says the latter, from sheer wantonness, without eating a single leaf, and it is said to be also very destructive to the buds of trees. For a long while classed among the *Fringillidæ*, *Musophagidæ* or *Tanagridæ*, its complete difference from any one of these Families became at last evident, and, chiefly from the position of the song-muscles,[2] it is now regarded as forming a Family of its own, *Phytotomidæ*, one of the undeveloped or lower forms of PASSERES so abundant in and so characteristic of South America—not to say Patagonia. Mr. Sclater (*Cat. B. Br. Mus.* xiv. pp. 406-408) recognizes 3 more species—*P. angustirostris* from Bolivia, *P. raimondii* from the west coast of northern Peru, and *P. rutila* of the Argentine territory and Patagonia, where it is common, according to Mr. Hudson, who gives (*Argent. Orn.* p. 164, pl. viii.) a brief but lively account of its habits, and pretty figures of both sexes.

PLATYSTERNÆ, Nitzsch's name, first published in 1840 (*Pterylographia*, p. 170), for what Merrem had already termed RATITÆ.

PLOVER, French *Pluvier*, Old French *Plovier*, which doubtless has its origin in the Latin *pluvia*, rain (as witness the German equivalent *Regenpfeifer*, Rain-fifer); but the connexion of ideas between the words therein involved, so that the former should have become a bird's name, is doubtful. Belon (1555) says that the name *Pluvier* is bestowed "pour ce qu'on le prend mieux en temps pluvieux qu'en nulle autre saison," which is not in accordance with modern observation, for in rainy weather Plovers are wilder and harder to approach than in fine. Others have thought it is from the spotted (as though with rain-drops) upper plumage of two of the commonest species of Plovers, to which the name especially belongs — the *Charadrius pluvialis* of Linnæus, or Golden Plover, and the *Squatarola helvetica* of recent ornithologists, or Grey Plover. Both these birds are very similar in general appearance, but the latter is the larger and has an aborted hind-toe on each foot,[1] while its axillary feathers, which in the Golden Plover are pure white, are black, and this difference often affords a ready means of distinguishing the two species when on the wing, even at a considerable distance. The Grey Plover is a bird of almost circumpolar range, breeding in the far north of America, Asia and eastern Europe,[2] frequenting in spring and autumn the coasts of the more temperate parts of each continent, and generally retiring further southward in winter—examples not unfrequently reaching the Cape Colony, Ceylon, Australia and even Tasmania. *Charadrius pluvialis* has a much narrower distribution, though where it occurs it is much more numerous as a species. Its breeding-quarters do not extend further than from Iceland to western Siberia, but include the more elevated tracts in the British Islands, whence in autumn it spreads itself, often in immense flocks, over the cultivated districts if the fields be sufficiently open. Here some will remain so long as the absence of frost or snow permits, but the majority make for the Mediterranean basin, or the countries beyond, in which to winter; and, as with the Grey Plover, stragglers find their way to the

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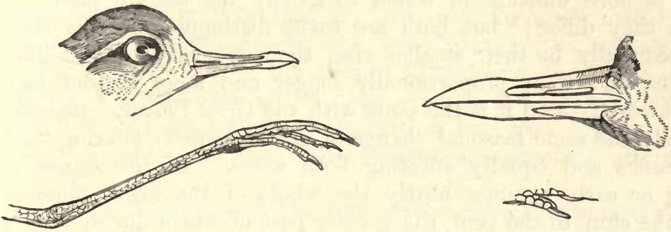
[1] It may be remarked that nomenclatural purists, objecting to the names *Pitta* and *Philepitta* as "barbarous," call the former *Coloburis* and the latter *Paictes*. *Brachyurus* also has frequently been used for *Pitta*; but is inadmissible, having been previously applied in another sense.

[2] This fact was ascertained and published by Eyton (*Zool. Voy. Beagle, Birds* p. 153), from a specimen brought home by Mr. Darwin.



CHARADRIUS (head and foot). SQUATAROLA (bill and hind toe).

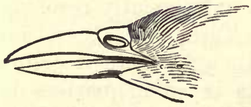
(After Swainson.)

[1] But for this really unimportant distinction both would doubtless have been kept in the same genus, for they agree in most other structural characters. As it is they have long been sundered.

[2] The earliest account of its breeding in America was no doubt mistaken, but it was found there by Mr. MacFarlane in 1864. The first discovery of its eggs was by Von Middendorff in 1843, who described them (*Sib. Reise*, ii. p. 209, pl. xix. fig. 1), while another obtained by him has since been figured (*Proc. Zool. Soc.* 1861, p. 398, pl. xxxix. fig. 2). Subsequently it was found breeding in Europe by Messrs. Harvie-Brown and Seebohm (*Ibis*, 1876, pp. 222-230, pl. v.).

southern extremity of Africa. The same may be said, *mutatis mutandis*, of two other cognate forms, *C. virginicus* and *C. fulvus*, which respectively represent *C. pluvialis* in America and Eastern Asia, where they also are known by the same English name. The discrimination of these two birds from one another requires a very acute eye, and room is here wanting in which to specify the minute points in which they differ;[1] but both are easily distinguished from their European ally by their smaller size, their greyish-brown axillary feathers, and their proportionally longer and more slender legs. All, however,—and it is the same with the Grey Plover,—undergo precisely the same seasonal change of colour, greatly altering their appearance and equally affecting both sexes. In the course of spring or early summer nearly the whole of the lower plumage from the chin to the vent, the greater part of which during winter has been white, becomes deep black. This is partly due to the growth of new feathers, but partly to some of the old feathers actually changing their colour, though the way in which the alteration is brought about is still uncertain.[2] A corresponding alteration is at the same season observable in the upper plumage; but this seems chiefly due (as in many other birds) to the shedding of the lighter-coloured margins of the feathers, and does not produce so complete a transformation of appearance, though the beauty of the wearer is thereby greatly increased.

The birds just spoken of are those most emphatically entitled to be called Plovers; but the DOTTEREL, the group of Ringed Plovers before mentioned (KILLDEER) and the LAPWING, with their allies, have, according to usage, hardly less claim to the name, which is also extended to some other more distant forms that can here have only the briefest notice. Among them one of the most remarkable is the *Pluvianus* or *Hyas ægyptius* of ornithologists, celebrated for the services it is said to render to the crocodile—a small bird whose plumage of delicate lavender and cream-



PLUVIANUS. (After Swainson.)

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[1] Schlegel (*Mus. Pays-Bas*, *Cursores*, p. 53) states that in some examples it seems impossible to determine the form to which they belong; but ordinarily American specimens are rather larger and stouter, and have shorter toes than those from Asia.

[2] It is much to be regretted that ornithologists favourably situated in regard to zoological gardens have not used more extensively opportunities which might there be enjoyed of conducting useful observations on this subject and others of the kind. Elsewhere it would be hardly possible to carry on such an investigation, and even in the best circumstances it would not be easy and would require unremitting attention. The results of some partial observations superintended by Yarrell in the gardens of the Zoological Society of London are given in its *Transactions* (i. pp. 13-19). Little of this nature has been done there since.

colour is relieved by markings of black and white.[1] This probably belongs to the small section generally known as Coursers, *Cursorius*, allied to which are the curious Pratincoles, also peculiar to the Old World, while the genera *Thinocorys* and *Attagis* form an outlying group peculiar to South America, that is by some systematists regarded as a separate Family "*Thinocoridæ*," near which are often placed the singular Sheathbills. By most authorities the Stone-Curlews, the Oyster-catchers and Turnstones are also regarded as belonging to the Family *Charadriidæ*, and some would add the Avosets and Stilts, among which the Crab-Plover or "Cavalier," *Dromas ardeola*—a form that has been bandied about from one Family and even Order to another—should possibly find its place.

Though the various forms here spoken of as Plovers are closely allied, they must be regarded as constituting a somewhat indefinite group, for no very strong line of demarcation can be drawn between them and the Sandpipers and Snipes. United, however, with both of the latter, under the name of Limicolæ, after the method approved by recent systematists, the whole form an assemblage the compactness of which no observant ornithologist can hesitate to admit, even if he be not inclined to treat as its nearest relations the Bustards on the one hand and the "Gaviæ" on the other.[2]

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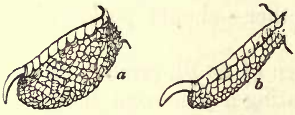
[1] The elder Geoffroy-St. Hilaire (*Mém. du Mus.* xv. pp. 466, 467) in 1827 was apparently the first to identify this bird with the τροχίλος of Herodotus (*cf.* Humming-bird, p. 442, note 2), and did so from having actually seen it enter the Crocodile's mouth, while his testimony is confirmed by the experience of Dr. A. E. Brehm, who says (*Thierleben*, Vögel, ed. 2, iii. p. 216) that he had repeatedly seen it thus act. In the face of the positive assurance of two such competent witnesses it would be rash to conclude that another observer, who seems to be no ornithologist, is right in attributing (*Ibis*, 1893, p. 277) the part of the "Crocodile-bird" to *Hoplopterus spinosus* (Lapwing), though Dr. A. L. Adams (*Ibis*, 1864, p. 29) and Mr. A. C. Smith (*Attractions of the Nile*, ii. pp. 255, 256)—neither of whom had witnessed the feat—had already made the same suggestion. However, other ornithological observers of equal, if not greater repute, such as Mr. E. C. Taylor (*Ibis*, 1859, p. 52; 1867, p. 68), Von Heuglin (*Orn. Nord-ost Afrika's*, pp. 978, 979), and M. d'Aubusson (*Echassiers d'Egypte*, pp. 16-18), without professing personal experience, hold to *Pluvianus* rather than *Hoplopterus* being the reptile's benefactor, and so the matter must be left, though the balance of scientific opinion is sufficiently declared.

[2] In this connexion it is necessary to mention Mr. Seebohm's lavishly illustrated *Geographical Distribution of the Family Charadriidæ* (4to, London: without date, but published in 1887), under which term he comprises all the ordinary Plovers, Sandpipers and Snipes, but excludes *Attagis*, *Chionis*, *Dromas* and *Thinocorys*. It would be out of place here to dwell upon his speculations, and it is enough to state his arrangement of the forms he includes. Professing to despise "structural characters," upon them he yet chiefly grounds nearly all his groups, but chooses characters which most taxonomers regard as of minor

PLOVER'S PAGE, a local name for the DUNLIN from its curious habit of flying in company with a Golden PLOVER, as though waiting upon it, when both species are breeding on the same part of a moor. The common Icelandic name Lóuþræll (anciently *Lóarþræll*) has a like origin, *Lóa* being a Plover and *þræll* (*Anglice* thrall) a servant.

POCHARD, POCKARD or POKER,[1] names properly belonging to the male of a species of Duck (the female of which is known as the Dunbird), the *Anas ferina* of Linnæus, and *Nyroca*, *Æthyia* or *Fuligula ferina* of later ornithologists—but names very often applied by writers in a general way to most of the subfamily "*Fuligulinæ*," commonly called Diving or Sea-DUCKS, the members of which can be readily distinguished by the greater development of the lobe of the hallux from those of the *Anatinæ* or Freshwater-Ducks. The Pochard in full plumage is a very handsome bird, with a coppery-red head, on the sides of which



a, HALLUX OF "SEA-"; *b*, OF "FRESHWATER"-DUCK. (After Swainson.)

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importance, while those which seem far more significant are entirely neglected, so that his remark that his subdivisions are "very probably artificial" will not provoke dissent. In diagnosing his three subfamilies (p. 66), his "*Scolopacinæ*" are distinguished by having the "toes all cleft to the base"—his other two, "*Totaninæ*" and "*Charadriinæ*," by having the "middle and outer toes connected by a web at the base." Yet having assigned so much value to the presence or absence of the interdigital web, which seldom exists but in a rudimentary state, when it becomes most developed he proceeds to disregard it wholly by uniting in one genus the AVOSETS and the STILTS, and no reason is given for this inconsistency. What to most ornithologists seems a character of some significance, as directly affecting the bird's economy, is by him wholly disregarded. This is the structure of the bill—whether it be a hard and horny chisel as in an OYSTER-CATCHER or a TURNSTONE, or a sensitive organ of perception as in a SNIPE or a GODWIT. Thus we find *Hæmatopus* grouped with *Limosa*, and *Strepsilas* with *Scolopax*, while *Tringa* and *Ereunetes* are severed. It would not be so very great an exaggeration of Mr. Seebohm's practice to say that when two species have very different bills it is expedient to put them in the same subfamily, if not (as in the cases of *Anarhynchus* and *Ægialitis*, and of *Eurinorhynchus* and *Tringa*) in the same genus. If results like these legitimately follow—though this I take leave to doubt—from the teaching of "the new school of modern ornithologists" (p. iv.), a man who has any regard for common sense, not to say for science, may congratulate himself on not being imputed a member of it. Yet the many beautiful figures given by Mr. Seebohm will always make his work acceptable to ornithologists of all schools, despite his numerous vagaries.

[1] The derivation of these words, in the first of which the *ch* is pronounced hard, and the *o* in all of them generally long, is very uncertain. Cotgrave has *Pocheculier*, which he renders "Shoueler," nowadays the name of a kind of Duck, but in his time meaning the bird we commonly call SPOONBILL. Littré gives *Pochard* as a popular French word signifying drunkard. That this word

sparkle the ruby irides of his eyes, relieved by the greyish-blue of the basal half of his broad bill, and the deep black of his gorget, while his back and flanks appear of a light grey, being really of a dull white closely barred by fine undulating black lines. The tail-coverts both above and below are black, the quill feathers brownish-black, and the lower surface of a dull white. The Dunbird has the head and neck reddish-brown, with ill-defined whitish patches on the cheeks and chin, brown irides, the back and upper tail-coverts dull brown, and the rest of the plumage, except the lower tail-coverts, which are brownish-grey, much as in the Pochard. This species is very abundant in many parts of Europe, northern Asia, and North America, generally frequenting in winter the larger open waters, and extending its migrations to Barbary and Egypt, but in summer retiring northward and inland to breed, and is one that has certainly profited by the legislative protection lately afforded to it in Britain, for, whereas during many years it had but a single habitual breeding-place left in England, it is now known to have several, to some of which it resorts in no inconsiderable numbers. American examples seem to be slightly larger and somewhat darker in colour, and hence by some writers have been regarded as specifically distinct under the name of *N.* or *F. americana*; but America has a perfectly distinct though allied species in the celebrated Canvas-back Duck, *N. vallisneriana*, a much larger bird, with a longer, higher and narrower bill, which has no blue at the base, and, though the plumage of both, especially in the females, is very similar, the male Canvas-back has a darker head, and the black lines on the back and flanks are much broken up and further asunder, so that the effect is to give these parts a much lighter colour, and from this has arisen the bird's common though fanciful name. Its scientific epithet is derived from the freshwater plant, a species of *Vallisneria*, usually known as "wild celery," from feeding on which its flesh is believed to acquire the delicate flavour that is held in so great a repute. The Pochard and Dunbird, however, in Europe are in much request for the table (as the German name of the species, *Tafelente*, testifies), though their quality in this respect depends almost wholly on the food they have been eating, for birds killed on the sea-coast are so rank as to be almost worthless, while those that have been frequenting fresh water are generally well-tasted.[1]

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would in the ordinary way become the English Pochard or Poker may be regarded as certain; but then it is not known to be used in French as a bird's name.

[1] The plant known in some parts of England as "willow-weed"—not to be confounded, as is done by some writers, with the willow-wort (*Epilobium*)—one of the many species of *Polygonum*, is especially a favourite food with most kinds of Ducks, and to its effects is attributed much of the fine flavour which distinguishes the birds that have had access to it.

Among other species nearly allied to the Pochard that frequent the northern hemisphere may be mentioned the SCAUP-Duck, *N. marila*, with its American representative *N. affinis*, in both of which the male has the head black, glossed with blue or green; but these are nearly always uneatable from the nature of their food, which is mostly gathered at low tide on the "scaups" or "scalps"[1]—as the banks on which mussels and other marine mollusks grow are in many places termed. Then there are the Tufted Duck, *N. cristata* —black with a crest and white flanks—and its American equivalent *N. collaris*, and the White-eyed or Castaneous Duck, *N. castanea* or *F. nyroca*, and the Red-crested Duck, *N. rufina*—both peculiar to the Old World, and the last, conspicuous for its red bill and legs, well known in India. In the southern hemisphere the genus is represented by three species, *N. capensis*, *N. australis* and *N. novæ-zealandiæ*, whose respective names indicate the country each inhabits, and in South America exists a somewhat divergent form which has been placed in a distinct genus as *Metopiana peposaca*.

Leaving the SCOTERS for further consideration, a few words may be here added to what has been already said of the small group known as the EIDERS, which, though generally classed with the "*Fuligulinæ*," differ from them in several respects: the bulb at the base of the trachea in the male, so largely developed in the members of the genus *Nyroca*, and of conformation so similar in all of them, is here much smaller and wholly of bone; the males take a much longer time, two or even three years, to attain their full plumage, and some of the feathers on the head, when that plumage is completed, are always stiff, glistening and of a peculiar pale-green colour. This little group of hardly more than half a dozen species may be fairly considered to form a separate genus under the name of *Somateria*. Many authors indeed have—unjustifiably, as it seems to the present writer—broken it up into three or four genera. The well-known Eider, *S. mollissima*, is the largest of this group, and, beautiful as it is, is excelled in beauty by the King-Duck, *S. spectabilis*, and the little *S. stelleri*. Space fails here to treat of the rest, but the sad fate which has overtaken one of them, *S. labradoria*, has been before mentioned (EXTERMINATION, pp. 221-223);[2] and only the briefest notice can be taken of that most interesting form generally, but obviously in error, placed among them, the LOGGER-HEAD (p. 518), Racehorse or Steamer-Duck, *Tachyeres* or *Micropterus cinereus* of the Falkland Islands and Straits of Magellan—nearly as large as a tame Goose, and subject, as is asserted, to the, so far as known, unique peculiarity of losing its power of flight after reaching maturity.

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[1] Cognate with *scallop*, and the Dutch *schelp*, a shell.

[2] The statements made at this reference have been criticized by Mr. Dutcher (*Auk*, 1894, pp. 4-12). In the main they are confirmed by what he says, though he adduces evidence, which it is not for me to dispute, as to examples of the species, subsequently adding (*tom. cit.* p. 176) one more, having been obtained since 1852, the latest year that had been known to me as a certainty for its existence. Whether it survived (as is now, to use the American idiom, "claimed") until 1875 signifies little. That it is extinct I think no one will justifiably deny, though no one would be better pleased than myself to learn that

PODARGUS, a genus of birds so named by Vieillot in 1819, being based on the *Podarge* of Cuvier, and used by Gould and other writers as an English word (see MOREPORK, p. 592, and NIGHTJAR, p. 638).

POE-BIRD, another name for the PARSON-BIRD.

POLLEX, the thumb or first digit of the wing, never consisting of more than two phalanges, of which the terminal one is often aborted or absent; but, when fully developed, it often bears a horny CLAW. From the basal phalanx grows the so-called "bastard wing."

POLYMYODI (or POLYMYODÆ if a feminine termination be needed), Johannes Müller's name (*Abhandl. k. Akad. Berlin, Phys. Kl.* 1847, p. 366) for the first of his three groups of PASSERINI, from the many song-muscles they possess, equivalent to the OSCINES of Keyserling and Blasius.

POMPADOUR,[1] the name given by Edwards in 1759 (*Gleanings*, ii. p. 275, pl. 341) to one of the most beautiful of the *Cotingidæ* (CHATTERER), and since generally adopted, though prior to his publication of the species it had been already described and figured by Brisson (*Ornithol.* ii. p. 347, pl. xxxv. fig. 1). It is the *Ampelis pompadora* of Linnæus, referred now to the genus *Xipholena*, a native of Guiana, Surinam and Cayenne, and easily recognized by the shining crimson-purple of its plumage, set off by its white wings. Two other allied species, *X. atripurpurea* and *X. lamellipennis*, inhabit Brazil (*cf.* Sclater, *Cat. B. Br. Mus.* xiv. pp. 387-389).

POOL-SNIPE, said to be a local name of the REDSHANK.

POOR SOLDIER, a name for the Australian FRIAR-BIRD.

POPE, one of the many local names of the PUFFIN, *Fratercula arctica*, as well as of the BULLFINCH.

POPELER, an old name for the SPOONBILL, *Platalea leucorodia*,

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it is not so; but anybody who has taken the trouble to investigate the history of an exterminated species will find that to determine the time when it ceased from appearing is no easy thing.

[1] As a bird's name in French, *Pompadour* signifies a breed of domestic poultry, apparently that which we call the Polish.

possibly a mispronunciation of the Dutch *Lepelaar*, which means the same bird.

POPINJAY, a word of respectable antiquity since it is used in some manuscript copies of Chaucer (*Canterb. Tales*, 13,299), while the French *Papegai*, written "Papejay," is used in others. Prof. Skeat, whose remarks (*Etymol. Dict.* p. 456) deserve all attention, concludes "that F. *papegai*, a talking jay, was modified from the older O. F. *papegau*, a talking cock," akin to the Italian *Papagallo*—the first half of all these words being cognate with "babble." Originally the name signified PARROT, but since most of the best-known Parrots are green, it has in this country been transferred to the Green WOODPECKER. It was also the wooden figure of a bird set up as a mark to be shot at. The Arabic *babaghá* (a Parrot), from which some derive *Papagau* and other forms, seems itself to be a corruption of the Spanish *Papagayo*.

PORT-EGMONT HEN, the Southern Great SKUA, so called by seamen in the last century from its familiarity about the place of that name in the Falkland Islands (*cf.* Latham, *Gen. Synops.* iii. p. 386).

POST-BIRD, a local name of the Spotted FLYCATCHER, *Muscicapa grisola*, from its habit of sitting on posts when looking out for prey (see p. 274).

POTOO, the Creole name for one of the NIGHTJARS, *Nyctibius jamaicensis* (Gosse, *B. Jamaica*, p. 41).

POWDER-DOWNS are so called from the powder produced by the continuous disintegration of the numerous brush-like barbs and barbules, into which the barrel is constantly splitting as it grows without forming a principal shaft. In size, form and situation they vary much. In the *Psittaci* they are very short tufts, the barrel hardly projecting from the skin, while in *Botaurus* the barrel is nearly half an inch long, and bears a short tuft of very fine filaments. In *Podargus* they attain their extreme size and complexity, being about two inches long. In some cases Powder-downs occur over the greater part of the body, among the contour-feathers as well as on the featherless spaces, in others they grow in more or less distinct tracts or in compact patches. The appearance of these peculiar organs, scattered as it were throughout various groups—Tinamous, Herons, Diurnal Birds-of-Prey, Parrots and in a few members of other groups—seems to be rather an illustration of isomorphism than an indication of affinity. Hitherto they have been found to exist as follows:—

Crypturi—interspersed among the contour-feathers of the large dorsal tract.

Ardeidæ—all the Herons and Bitterns possess them in pairs, forming large thick patches on the breast, the lower back and frequently on the abdomen. These patches are greasy and yellow at the base, but the tufts are very fine, grey or blackish, and produce a bluish powder.

Balæniceps—a pair of large patches on the middle of the lower back.

Rhinochetus and *Eurypyga*—numerous, forming tracts as well as detached spots.

Mesites—five pairs of patches, the arrangement of which somewhat resembles the distribution of the powder-downs in the two genera last named.

Accipitres—at present only found in *Elanus*, *Cymindis* and *Circus*, as a large united patch on the lower back or as a pair on the same part. Nitzsch states that *Gypaetus* has scattered powder-downs during its immaturity, and probably many other *Accipitres*, especially of the *Vulturidæ*, will on further examination have to be included.

Psittaci—numerous scattered tracts and separate tufts on the neck, shoulders and sides of the trunk, in the *Cacatuinæ*, in *Chrysotis* and in *Psittacus*.

Podargus—a pair of extremely developed patches on the lower back.

Leptosoma—resembles the last in the distribution of the patches, but *Coracias* has only scattered powder-downs.

Passeres—in this enormous group *Artamus* is the only genus known to possess them. They occur in all the species, in patches on the sides of the breast, the thighs and lower back, and have a strong barrel, one-third of an inch long.

(See FEATHERS, PTERYLOSIS.)

POWEE, commonly applied in the West Indies to *Crax alector*, if not to the CURASSOWS generally, and said in 1769, by Bancroft, who spells the word "Powese" (*Nat. Hist. Guyana*, pp. 193-195), to be so called "by the natives from their cry, which is similar to that name." Frisch in 1763 (*Vorstell. Vög. Deutschl. u. s. w.* Haupt-Art. ix. Abth. 2, No. iv.) has the word *Poes*, which Buffon (*Hist. Nat. Ois.* ii. p. 374) misprinted *Pocs*, while P. L. S. Müller (*Natursyst.* ii. p. 465) spells it *Pauwis*. It seems possible that the Dutch *Paauw* (Peacock) may be the origin of the word.

PRÆCOCES, the name given by Sundevall (*K. Vet.-Acad. Handl.* 1836, p. 70), to his second section of the Class *Aves*, in contradistinction to ALTRICES, but subsequently abandoned by him.

PRAIRIE-CHICKEN, PRAIRIE-HEN, names given by the

English in North America to what is known in books as the Pinnated GROUSE, the *Tympanuchus americanus* of recent authors; or, where that does not occur, to forms of the allied genus *Pediocætes*—the Sharp-tailed GROUSE; but, according to Mr. Trumbull (*Names and Portr. of Birds*, Index, p. 218), the term "Prairie" is prefixed by American sportsmen to many more kinds of birds than there is need here to specify.

PRATINCOLE, a word invented in 1773 by Pennant (*Gen. B.* p. 48), being an English adaptation of *Pratincola*, applied in 1756 by Kramer (*Elenchus*, p. 381) to a bird which had hitherto received no definite name, though it had long before been described and even recognizably figured by Aldrovandus (*Ornithologia*, xvii. 9) under the vague designation of "*hirundo marina.*" It is the *Glareola pratincola* of modern ornithologists, forming the type of a genus *Glareola*, founded by Brisson in 1760, and unquestionably belonging (as is now generally admitted) to the group LIMICOLÆ, being either placed among the *Charadriidæ* (PLOVER,) or regarded as constituting a separate Family *Glareolidæ*. The Pratincoles, of which Mr. Seebohm (*Charadriidæ*, pp. 252-269) recognizes ten species—the last resting on a single specimen procured by the late Emin Pasha and described by Captain Shelley (*Proc. Zool. Soc.* 1888, p. 49)—are all small birds, slenderly built and mostly delicately coloured, with a short stout bill, a wide gape, long pointed wings and a tail more or less forked. In some of their habits they are thoroughly Plover-like, running very swiftly and breeding on the ground, but on the wing they have much the appearance of Swallows, and like them feed, at least partly, while flying.[1] The ordinary Pratincole of Europe, *G. pratincola*, breeds abundantly in many parts of Spain, Barbary and Sicily, along the valley of the Danube, and in Southern Russia, while owing to its great powers of flight it frequently wanders far from its home, and more than a score of examples have been recorded as occurring in the British Islands. In the south-east of Europe a second and closely-allied species, *G. nordmanni* or *G. melanoptera*, which has black instead of chestnut inner wing-coverts, accompanies or, further to the eastward, replaces it; and in its turn it is replaced in India, China and Australia by *G. orientalis.* Australia also possesses another species, *G. grallaria*, remarkable for the great length of its wings and much longer legs, while its tail is scarcely forked—peculiarities that have led to its being considered the type of a distinct genus or subgenus *Stiltia.* Two species, *G. lactea* and *G. cinerea*, from India and Africa respectively, seem by their pale coloration to be desert-forms, and they are the smallest of this curious little group. The species whose mode of nidification is known lay either two or three eggs, stone-coloured, blotched, spotted and streaked with black or brownish-grey. The young when hatched are clothed in down and are able to run at once—just as are young Plovers.

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[1] This combination of characters for many years led systematists astray, though some of them were from the first correct in their notions as to the Pratincole's position. Linnæus, even in his latest publication, placed it in the genus *Hirundo*; but the interleaved and annotated copies of his *Systema Naturæ* in the Linnean Society's library shew the species marked for separation and insertion in the Order *Grallæ*—*Pratincola trachelia* being the name by which he had meant to designate it in any future edition. He seems to have been induced to this change of view mainly through a specimen of the bird sent to him by John the brother of Gilbert White; but the opinion published in 1769 by Scopoli (*Ann. I. hist. naturalis*, p. 110) had doubtless contributed thereto, though the earlier judgment to the same effect of Brisson, as mentioned above, had been disregarded. Want of space here forbids a notice of the different erroneous assignments of the form, some of them made even by recent authors, who neglected the clear evidence afforded by the internal structure of the Pratincole. It must suffice to state that Sundevall in 1873 (*Tentamen*, p. 86) placed *Glareola* among the *Caprimulgidæ*, a position which its osteology shews cannot be maintained for a moment.

PRIMARIES, the larger quill-feathers of the wing growing from the manus, the rational mode of counting which is to begin, as with the CUBITALS, at the wrist, but to proceed outwards, so that the distal quill is the last, and not the first as in the popular way of enumeration.[1] The number of Primaries varies little. Most Birds possess 10 or 11; but 12 are found in *Podicipes*, *Phœnicopterus* and some of the *Ciconiidæ*, as *Anastomus*, *Leptoptilus*, *Mycteria* and *Tantalus.* As a rule the first 6 quills rest upon the united metacarpal bones ii. and iii., and when there are 12 Primaries 7 of them so originate, but the following Primary is always borne by the first phalanx of digit iii., while the next two quills are attached in all *Carinatæ* to the first phalanx of digit ii., its second phalanx carrying the rest—3 in *Struthio*, 2 in birds with 11, and only 1 in those with 10 Primaries; but here are to be mentioned certain special conditions. *Struthio* has as many as 16 Primaries, 8 of which belong to the metacarpals, while *Rhea* has the normal 12, and in *Casuarius* only 2 or 3 are attached to the manus, the rest of its barbless quills being really Cubitals. *Archæopteryx* apparently had only 6 or 7 Primaries, but it is doubtful whether they proceeded from the index and its metacarpal alone, or chiefly from the third digit and its metacarpal.[2] Peculiar conditions, hitherto unexplained, prevail also in the *Sphenisci*, which seem to have no true remiges, the posterior edge of their flipper-like wings being formed of a greatly increased number of little stiff feathers.

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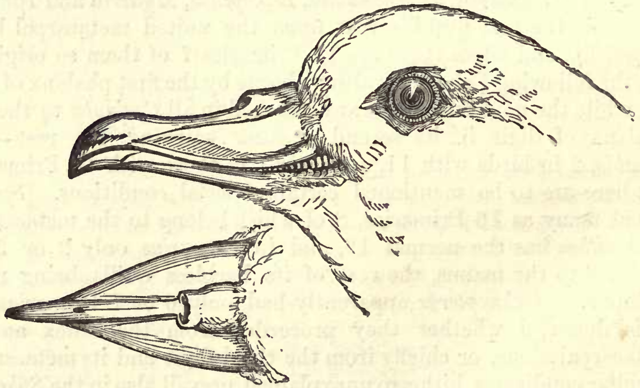
[1] In a wider sense the stiff feathers, from 2 to 4 in number, which grow from the POLLEX, and form the *alula* or "bastard wing," may also be accounted Primaries.

[2] As before stated (p. 279) the manus of *Archæopteryx* had 3 free digits; but I conceive the figure from Vogt (p. 280) to be fanciful and erroneous. The main point is the regularly-increasing number of the phalanges—the pollex having 2, the index 3 and the third digit 4.

The number of Primaries indicates a gradual reduction beginning at the distal end. Omitting the few birds with 7 metacarpal quills, we find that the 11th or terminal quill is never fully developed and often scarcely functional. It is always much shortened and concealed between its upper and lower covert, being not unfrequently shorter and weaker than its covert, which in that case is sometimes stiff. In some Rails and in many *Passeres* the 11th quill is very small indeed, or may be wholly absent. In this case, however, the upper covert is present as an apparently supernumerary feather, provided that the 10th quill is not much reduced. This last shews every intermediate stage between the largest development possible as in *Larus* and *Cypselus*, and a degenerate condition as in many of the so-called "*Oscines novempennatæ*,"[1] where the 10th primary is supposed to be absent or at least extremely small and concealed. In reality it is always present, even in the *Dicæidæ*, while in some *Hirundinidæ* it is more than half an inch, and in *Icteridæ* may be more than an inch long. In fact there are few birds in which this "absent" quill does not measure the third of an inch in length (see REMIGES).

PRION, a genus of PETRELS established by Lacépède (*Mém. de l'Inst.* iii. p. 514), on account of the denticulated or serrated edges



PRION VITTATUS. (After Buller.)

of their mandibles, and used as an English word by many writers. To it are referred the *Procellaria vittata* of Gmelin and several other species, all—with perhaps one exception, the *P. brevirostris* of Gould (*Proc. Zool. Soc.* 1855, p. 88, pl. xciii.), if indeed that be distinct, as seems very doubtful, from his *P. ariel*—belonging to the southern hemisphere. They are remarkable also for the breadth of their bill at the base.

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[1] Equivalent to the "Tanagroid Passeres" of Mr. Wallace (*Ibis*, 1874, p. 410), or the "Passeres Fringilliformes" of the *Catalogue of the Birds in the British Museum*, vols. x.-xii.

PROMEROPS, a name, long since Anglicized, invented by Réaumur, says Brisson (*Ornithol.* ii. p. 460, pl. xliii. fig. 2), who used it in a generic sense for a small South-African bird with plain plumage and a remarkably long tail. Without having seen a specimen Linnæus referred it to the genus *Upupa* (HOOPOE), but also described the same species, from a drawing sent to him by Burmann, as a *Merops* (BEE-EATER). *Promerops*, however, has nothing to do with either, though perhaps its true affinity is not yet correctly determined. Most modern systematists think it allied to the SUN-BIRDS[1] (*cf.* Layard, *B. S. Afr.* pp. 74, 75, and Shelley, *Monogr. Nectariniidæ*, p. 377, pl. 121), though it has none of the brilliant hues that distinguish most of that group, its yellow vent being all that enlivens the soberly-mottled white of its lower parts, while above it is of a uniform greyish-brown. A considerable number of birds, having apparently no affinity at all to it, have been referred to the genus *Promerops*, which probably should be regarded as the type of a Family. Natal furnishes a second species, *P. gurneyi*, described and figured by Verreaux (*Proc. Zool. Soc.* 1871, p. 135, pl. viii.)

PROUD TAILOR, a local name for the GOLDFINCH.

PSEUDOSCINES, Mr. Sclater's name (*Ibis*, 1880, p. 345) for the abnormal ACROMYODI of Garrod; but, being of hybrid derivation, Dr. Gadow (*Thier-reich, Vögel*, System. Th. pp. 173, 177) substituted SUBOSCINES in its stead, correlative with his SUBCLAMATORES.

PSILOPÆDES, a name proposed in 1872 by Sundevall (*Tentamen*, p. 1) for his first division (*agmen*) of the Class *Aves*, being the Birds whose young are naked before their feathers grow: in 1873 changed (*tom. cit.* p. 158) to *Gymnopædes*, to prevent confusion with PTILOPÆDES.

PSITTACI, given in 1826-8 as the name of a Family or group consisting of the PARROTS, by Ritgen (*N. Act. Acad. L.-C. Nat. Cur.* xiv. part i. pp. 231, 243), and afterwards adopted as that of an Order by Bonaparte and other authors, equivalent therefore to the

PSITTACOMORPHÆ of Prof. Huxley (*Proc. Zool. Soc.* 1867, pp. 465, 466), by whom it was regarded as the sixth group of his DESMOGNATHÆ.

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[1] In the *Catalogue of the Birds in the British Museum* (vol. ix.) *Promerops* is placed among the *Meliphaginæ*; but apparently not with the approval of the author (*tom. cit.* p. 209).

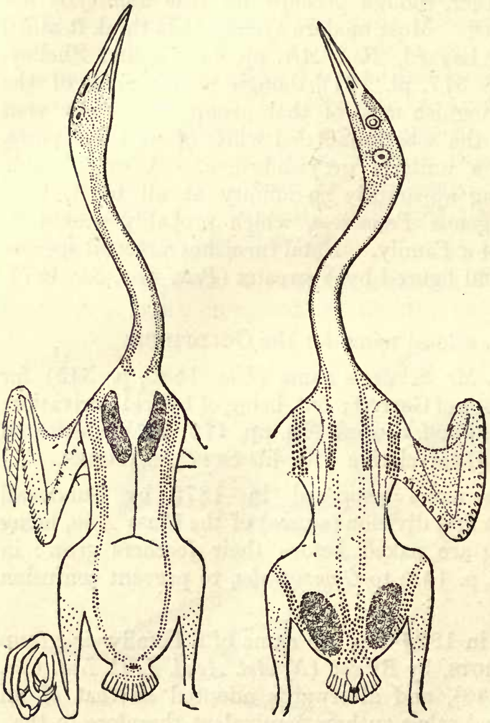
PTARMIGAN, Gael. *Tarmachan*, see GROUSE (p. 392, note).

PTEROCLETES,[1] Mr. Sclater's name (*Ibis*, 1880, p. 407) for the Order composed of the SAND-GROUSE, equivalent to the

PTEROCLOMORPHÆ of Prof. Huxley (*Proc. Zool. Soc.* 1868, p. 303), which itself was anticipated as a group by Bonaparte's *Pediophili* in 1831 (*Saggio &c.* p. 54).

PTERYGOIDS, a pair of bones in the roof of the mouth of every bird, articulating with the QUADRATES and the anterior end of the PALATALS, as well as, directly or indirectly, with the Basi-sphenoid and other parts of the SKULL.

PTERYLOSIS signifies plumage considered in regard to the distribution of its growth. In only a few Birds do the FEATHERS grow over the whole body, but they are generally restricted to well-defined patches or tracts, which in 1833 received from Nitzsch (*Pterylographiæ Avium pars prior*, p. 11) the name of *pteryla* (πτερόν, *pluma*; ὕλη, *sylva*) or "feather-forests," in opposition to the *apteria*, or featherless spaces, which intervene. Presumably the first bird-like creatures had their skin uniformly clothed; but the *Ratitæ*, *Sphenisci* and *Palamedea* are almost the only existing forms having the "Contour-feathers" (p. 241) evenly disposed over the body. It would be, however,



BOTAURUS STELLARIS. Ventral and dorsal aspect. The dark patches shew the "Powder-downs." (After Nitzsch.)

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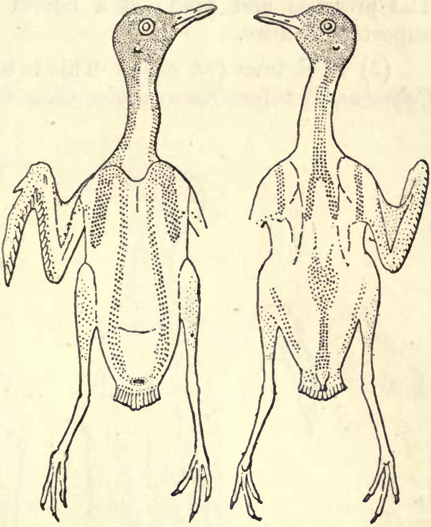
[1] It is no more easy to find a plural for the word *Pterocles* than for Patrocles, Themistocles or many others, but we may be quite sure that it would not take this form. Sundevall many years ago (*K. Vet.-Ac. Handl.* 1836, p. 119) had *Pteroclides*, which is perhaps possible.

a fallacy to look on this feature as proof of an archaic condition in them, since fully-developed embryos of both *Struthio* and *Apteryx* have well-defined *pterylæ*. If treated skilfully, *Pterylosis* is of prime taxonomic importance in Ornithology, though more in the investigation of small than of large groups. Unfortunately it can seldom be described in a few words, and hence it is chiefly or only those among its characters which can be expressed in terse and trim formulæ that appeal most to the mechanical constructor of classifications.[1]

The principal *pterylæ* or feathered tracts are as follows:—

(1) Spinal tract (*pt. spinalis*), extending along the vertebral column from neck to tail, bordered by the lateral, cervical and trunk *apteria* or featherless spaces. This tract is one of the most variable, its modifications, of which Nitzsch enumerated 17, being practically countless. It is rarely of the same width throughout, and is most frequently dilated on the back or between the shoulders, with or without a featherless space in the midst, the position and size of which varies much. In *Pelecanus*, *Fregata*, *Phaethon* and *Ardea* the space is narrow, and extends from the neck to the tail, in others as *Podicipes*, *Cuculi*, *Cypselus*, *Coracias* and *Opisthocomus* it is restricted to the back, in *Sula* to the interscapular region, in *Colymbus* to the neck. In some birds this *apterium*, whether interscapular, dorsal or lumbar, is rhomboidal, and it may become so large as to interrupt the spinal *pteryla*, which may end in an interscapular fork and begin again with a sacral bifurcation, or as a single streak; but there is no *apterium* in the spinal *pteryla* of the following:—*Ratitæ*, *Sphenisci*, *Phalacrocorax*, *Plotus*, *Palamedea*, *Tinami*, *Gallinæ* (pt.),



CHARADRIUS PLUVIALIS. Ventral and dorsal aspect. (After Nitzsch.)

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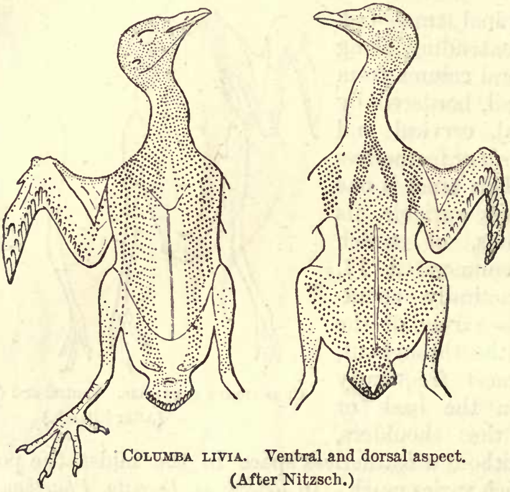
[1] Even this has taken place within comparatively few years, for Nitzsch's great work on the subject *Pterylographie* (Halle: 1840, 4to), which after his death was edited by Burmeister, excited but little and mostly unfavourable notice for nearly a quarter of a century after its publication. An English translation by the late Mr. Dallas was brought out in folio by Mr. Sclater for the Ray Society in 1867.

Grues (pt.), *Pterocles*, *Alcedinidæ*, *Momotidæ*, *Todidæ*, *Colii*, *Trogones*, *Menura*, *Atrichia* and most *Oscines*.

(2) Ventral tract (*pt. ventralis*). This is nearly as diverse as the foregoing, and is next to it in taxonomic value. It always has a longitudinal median *apterium* of variable extent, but in *Steganopodes* this is only a narrow space extending from the furcula to the vent, while in *Ardea* each half of the *pteryla* is but a narrow band. The presence and shape of a lateral pectoral branch is also an important feature.

(3) Neck-tract (*pt. colli*). This is unbroken in *Ratitæ*, *Sphenisci*, *Colymbus*, *Podicipes*, *Steganopodes*, *Ciconiidæ*, *Plataleidæ*, *Phœnicopterus*, *Anseres*, *Palamedea*, *Dicholophus*, *Otis tarda* (not *O. tetrax*), *Eupodotis*, *Eurypyga*, *Podica*, *Rhynchæa*, *Opisthocomus* and *Buceros*. All other birds have lateral cervical *apteria* of variable length, sometimes in addition to the median cervical *apteria* which, whether dorsal or ventral, are often long. What Nitzsch called *pterylæ colli laterales*, divided by a very broad dorsal and a ventral cervical *apterium*, occur only in the Herons and in *Otis tetrax*.



COLUMBA LIVIA. Ventral and dorsal aspect. (After Nitzsch.)

4. Wing-tract (*pt. alaris*), composed of the REMIGES with their coverts, and hence of great importance.

5. Tail-tract (*pt. caudalis*), composed chiefly of the RECTRICES with their upper and lower coverts.

6. Shoulder-tract (*pt. humeralis*), always well marked, consisting of the feathers, often called tertials, which grow from the

humerus, and with the SCAPULARS forming a narrow band across the upper arm parallel to the shoulder-blade.

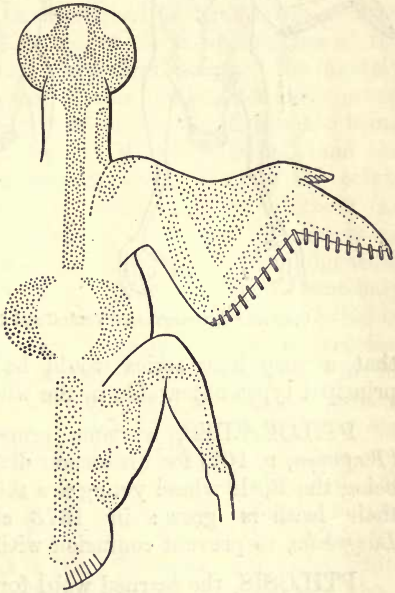
7. Femoral or Lumbar tract (*pt. femoralis s. lumbalis*), forming an oblique band on the outer side of the thigh.

8. Crural tract (*pt. cruralis*), clothing the legs so far as they are feathered.

9. Head-tract (*pt. capitis*), that which covers the head. Remarkable and of rare occurrence is a well-defined occipital *apterium* as is seen in *Colius* and *Trochilidæ*.

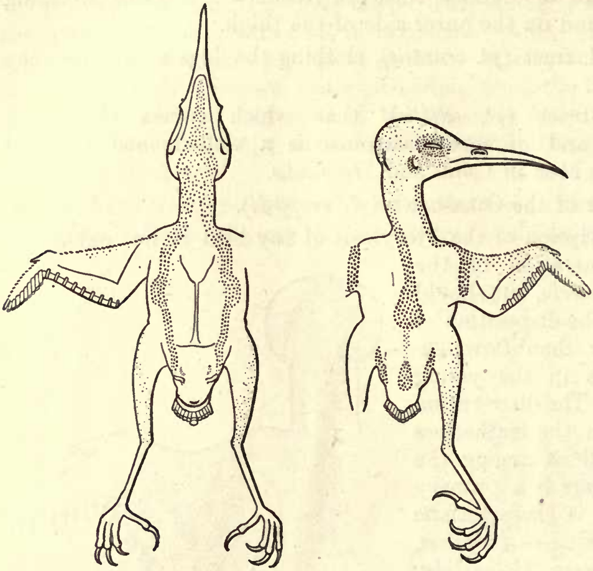
10. Tract of the OIL-GLAND (*pt. uropygii*).

The description of the Pterylosis of any bird is not exhausted by an enumeration of the *pterylæ* and *apteria*, but should also include the disposition of Downs, other than POWDER-DOWNS, both in the young and the old. The distribution of Downs on the featherless spaces as well as among the contour-feathers is a primary feature, and is characteristic of the following—*Accipitres*, *Alcidæ*, *Anseres*, *Cathartidæ*, *Ciconiidæ*, *Colymbidæ*, *Dicholophus*, *Eurypyga*, *Gruidæ*, *Laridæ*, *Opisthocomus*, *Palamedea*, *Phœnicopterus*, *Plataleidæ*, *Podica*, *Podicipedidæ*, *Psittaci*, *Rallidæ*, *Rhinochetus*, *Sphenisci*, *Steganopodes*, *Tubinares*—curiously also in *Cinclus* and in the aquatic members of the *Alcedinidæ*. Restriction of Downs to the *apteria* is found in the adults of *Ardeidæ*, *Caprimulgidæ*, *Cypselidæ*, *Cuculidæ*, *Gallinæ*, *Otididæ*, *Passeres* (except *Cinclus*), *Pteroclidæ*, *Scopus*, *Striges* and *Turnicidæ*. In the *Tinami* only are Downs confined to the *pterylæ*; but in them they are sparsely and frequently thinly developed, as is also the case with the *Cuculidæ*, *Dicholophus*, *Gallinæ*, *Limicolæ*, *Opisthocomus*, *Pteroclidæ*, *Turnicidæ* and some *Passeres*, while they are wholly absent in *Atrichia*, *Bucerotidæ*, *Capitonidæ*, *Coliidæ*, *Columbidæ*, *Coraciidæ*, *Eurylæmidæ*, *Galbulidæ*, *Menura*, *Meropididæ*, *Momotidæ*, *Picidæ*, *Ratitæ*, *Rhamphastidæ*, *Todidæ*, *Trochilidæ*, *Trogonidæ*, *Upupidæ* and in most *Passeres*.

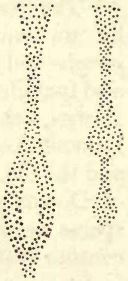


GECINUS VIRIDIS. Dorsal aspect.

The figures here inserted serve to shew some of the differences of Pterylosis presented by various birds; but it will be obvious that a very long series would be required to exhibit even the principal types observable in the whole Class.[1]



Cinnyris chloropygia. Ventral and dorsal aspect.



Arachnechthra and Cinnyris obscura. Dorsal tract.

PTILOPÆDES, a name proposed in 1872 by Sundevall (*Tentamen*, p. 102) for his second division (*agmen*) of the Class *Aves*, being the Birds whose young are thickly covered with down before their feathers grow: in 1873 changed (*tom. cit.* p. 158) to *Dasypædes*, to prevent confusion with Psilopædes.

PTILOSIS, the learned word for Plumage.

PUBIS (properly *Os pubis*) or *PUBIC* Bones, the anterior, most ventral and slenderest of the three component parts of the Pelvis.

PUCKERIGE (possibly connected with the A.S. *puca*, a goblin or demon), a name of the NIGHTJAR, and also of the disorder in the udders of cattle that it has been said to cause.

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[1] Since the time of Nitzsch additional descriptions of the Pterylosis of certain birds have appeared, but no special work on the subject, though it has by no means been exhausted, and such a work would be of considerable taxonomic utility if it were amply illustrated (little text being needed) and special attention paid to the numerous transitional forms that connect the chief types. A great and revised mass of information is to be found, however, in Prof. Fürbringer's *Untersuchungen der Morphologie und Systematik der Vögel.*

PUDDING-POKE, *i.e.* Pudding-bag, properly the nest of the Long-tailed TITMOUSE; but in common use transferred to the bird itself.

PUFF-BIRD, the name first given, according to Swainson (*Zool. Illustr.* ser. 1, ii. text to pl. 99), by English residents in Brazil to a group known to ornithologists as forming the restricted Family *Bucconidæ*, but for a long time confounded, under the general name of BARBETS, with the *Capitonidæ* of modern systematists, who regard the two Families as differing very considerably from one another. Some authors have used the generic name *Capito* in a sense precisely opposite to that which is now commonly accorded to it, and the natural result has been to produce one of the most complex of the many nomenclatural puzzles that beset Ornithology. Fortunately there is no need here to enter upon this matter, for each group has formed the subject of an elaborate work—the *Capitonidæ* being treated as before stated (p. 27) by the Messrs. Marshall, and the *Bucconidæ* by Mr. Sclater[1]—in each of which volumes the origin of the confusion has been explained, and to either of them the more curious reader may be confidently referred. The *Bucconidæ* are zygodactylous Birds belonging to the large heterogeneous assemblage in the present work called PICARIÆ, and are commonly considered nowadays to be most nearly allied to the *Galbulidæ* (JACAMAR). Like them they are confined to the Neotropical Region, in the middle parts of which, and especially in its Sub-Andean Subregion, the Puff-birds are, as regards species, abundant; while only two seem to reach Guatemala and but one Paraguay. As with most South-American Birds, the habits and natural history of the *Bucconidæ* have been but little studied, and of only one species, which happens to belong to a rather abnormal genus, has the nidification been described. This is the *Chelidoptera tenebrosa*, which is said to breed in holes in banks, and to lay white eggs much like those of the Kingfisher and consequently those of the Jacamars. From his own observation Swainson writes (*loc. cit.*) that Puff-birds are very grotesque in appearance. They will sit nearly motionless for hours on the dead bough of a tree, and while so sitting "the disproportionate size of the head is rendered more conspicuous by the bird raising its feathers so as to appear not unlike a puff ball. . . . When frightened their form is suddenly changed by the feathers lying quite flat." They are very confiding birds and will often station themselves a few yards only from a window. The *Bucconidæ* almost without exception are very plainly coloured, and the majority have a spotted or mottled plumage suggestive of immaturity. The first Puff-bird known to Europeans seems to have been that described by Marcgrave under the name of "*Tamatia*," by which it is said to have been called in Brazil, and there is good reason to think that his description and figure—the last, comic as it is in outline and expression, having been copied by Willughby and many of the older authors—apply to the *Bucco maculatus* of modern Ornithology—a bird placed by Brisson (*Ornithologie*, iv. p. 524) among the Kingfishers. But if so, Marcgrave described and figured the same species twice, since his "*Matuitui*" is also Brisson's "*Martin pescheur tacheté du Brésil*."

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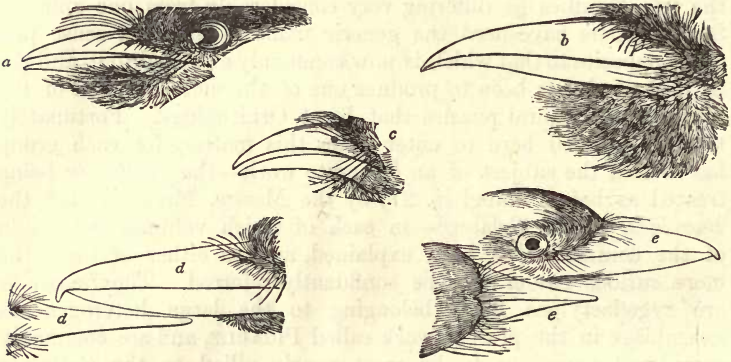
[1] *A Monograph of the Jacamars and Puff-birds, or Families* Galbulidæ *and* Bucconidæ. London: 1879-82, 4to.



a, Malacoptila ; *b*, Monacha ; *c*, Chelidoptera ; *d*, Bucco maculata ; *e*, B. tamatia. (After Swainson.)

Mr. Sclater in his *Monograph* divided the Family into 7 genera, of which *Bucco* is the largest and contains 20 species. The others are *Malacoptila* and *Monacha* each with 7, *Nonnula* with 5, *Chelidoptera* with 2, and *Micromonacha* and *Hapaloptila* with 1 species each, treating them precisely in the same way in 1891 (*Cat. B. Br. Mus.* xix. pp. 178-208). The most showy Puff-birds are those of the genus *Monacha* with an inky-black plumage, usually diversified by white about the head, and a red or yellow bill. The rest call for no particular remark.

PUFFIN, the common English name of a sea-bird, the *Fratercula arctica* of most ornithologists, known, however, on various parts of the British coasts as the Bottlenose, Coulterneb, Pope, Sea-Parrot, and Tammy-Norie, to say nothing of other still more local designations, some (as Marrott and Willock) shared also with allied species of *Alcidæ*, to which Family it has, until very lately, been invariably deemed to belong. Of old time Puffins were a valuable commodity to the owners of their breeding-places, for the young were taken from the holes in which they were hatched, and "being exceeding fat," as Carew wrote in 1602 (*Survey of Cornwall*, fol. 35), were "kept salted, and reputed for fish as coming neerest thereto in their taste." In 1345, according to a document from which an extract is given in Heath's *Islands of Scilly* (p. 190) those islands were held of the crown at a yearly rent of 300 Puffins[1] or 6s. 8d., being one-sixth of their estimated annual value. Some years later (1484), either through the birds having grown scarcer or money cheaper, only 50 Puffins are said (*op. cit.* p. 196) to have been demanded. It is stated by both Gesner and Caius that they were allowed to be eaten in Lent. Ligon, who in 1673 speaks (*Hist. Barbadoes*, p. 37) of the ill taste of Puffins "which we have from the isles of Scilly," and adds, "this kind of food is only for servants." Puffins used to resort in vast numbers to certain stations on the coast, and are still plentiful on some,[2] reaching them in spring with remarkable punctuality on a certain day, which naturally varies with the locality, and after passing the summer there, leaving their homes with similar precision. They differ from most other *Alcidæ* in laying their single egg (which is white, with a few grey markings, when first produced but speedily begrimed by the soil) in a shallow burrow, which they either dig for themselves or appropriate from a rabbit, for on many of their haunts rabbits have been introduced. Their plumage is of a glossy black above—the cheeks grey, encircled by a black band—and pure white beneath; their feet are of a bright reddish-orange, but the most remarkable feature of these birds, and one that gives them a very comical expression, is their huge bill. This is very deep and laterally flattened, so as, indeed, to resemble a coulter, as one of the bird's common names expresses; but moreover it is parti-coloured—blue, yellow and red—curiously grooved and still more curiously embossed in places, that is to say, during the breeding-season, when the birds are most frequently seen. But it had long been known to some observers that such Puffins as occasionally occur in winter (most often dead and washed up on the shore) presented a beak very different in shape and size, and to account for the difference was a standing puzzle. Many years ago Bingley (*North Wales*, i. p. 354) stated that Puffins "are said to change their bills annually." The remark seems to have been generally overlooked; but it has proved to be very near the truth, for after investigations carefully pursued during some years by Dr. Bureau of Nantes he was in 1877 enabled to shew (*Bull. Soc. Zool. France*, ii. pp. 377-399)[1] that the Puffin's bill undergoes an annual MOULT, some of its most remarkable appendages, as well as certain horny outgrowths above and beneath the eyes, dropping off at the end of the breeding-season, and being reproduced the following year. Not long after the same naturalist announced (*op. cit.* iv. pp. 1-68) that he had followed the similar changes which he found to take place, not only in other species of Puffins, as the *Fratercula corniculata* and *F. cirrhata* of the Northern Pacific, but in several birds of the kindred genera *Cerorhyncha*, the Horn-billed AUK, and *Simorhynchus* inhabiting the same waters, and consequently proposed to regard all of them as forming a Family distinct from the *Alcidæ*—a view which has since found favour with Dr. Dybowski (*op. cit.* vii. pp. 270-300 and viii. pp. 348-350), though there is apparently insufficient reason for accepting it.

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[1] There can not be much doubt that the name Puffin given to these young birds, salted and dried, was applied on account of their downy clothing, for an English informant of Gesner's described one to him (*Hist. Avium*, p. 110) as wanting true feathers, and being covered only with a sort of woolly black plumage. It is right, however, to state that Caius expressly declares (*Rarior. animal. libellus*, fol. 21) that the name is derived "a naturali voce pupin." Prof. Skeat states that the word is a diminutive, which favours the view that it was originally used for these young birds. The parents were probably known by one or other of their many local names.

[2] In 1893 I took some trouble to make an estimate, though from the nature of the case a very rough one, of the number of Puffins which had their home in one locality among the Hebrides. The calculation worked out to be *three millions*, and my friend Mr. Henry Evans, to whose kindness I was indebted for the opportunity of visiting the place, considered that number not to be excessive. In 1894 I was again at the same spot and was inclined to think that I had before underrated the number.

The name Puffin has also been given in books to one of the SHEARWATERS, and its Latinized form *Puffinus* is still used in that sense in scientific nomenclature. This fact seems to have arisen from a mistake of Ray's, who, seeing in Tradescant's Museum and that of the Royal Society some young Shearwaters from the Isle of Man, prepared in like manner to young Puffins, thought they were the birds mentioned by Gesner (*loc. cit.*), as the remarks inserted in Willughby's *Ornithologia* (p. 251) prove; for the specimens described by Ray were as clearly Shearwaters as Gesner's were Puffins.

PUKRAS, from its name in one of the dialects in the North-western Himalaya, a species of PHEASANT (well-known to Anglo-Indian sportsmen, by whom it is also called the "Koklas"), the *Pucrasia macrolopha* of most ornithologists. The cock is remarkable for his very long ear-tufts of glossy black, which contrast with the large spot of pure white on each side of the neck; but the rest of his plumage is comparatively unobtrusive, while the hen, as usual among the Pheasants, is very plainly coloured. Beside a local form which seems to be peculiar to Cashmere and Gilgit, Mr.

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[1] A translated abstract of this paper—containing an account of what is perhaps the most interesting discovery of the kind made in Ornithology for many years—is given in the *Zoologist* for 1878 (pp. 233-240) and another in the *Bulletin of the Nuttall Ornithological Club* for the same year (iii. pp. 87-91).

Ogilvie Grant (*Cat. B. Br. Mus.* xxii. pp. 310-316) recognizes 5 other species, one inhabiting Affghanistan, a second Nepal and the rest Tibet or China.

PULLASTRÆ, an Order proposed by Sundevall (*K. Vet.-Acad. Handl.* 1836, pp. 69, 116) to contain the CURASSOWS, LYRE-BIRD, PLANTAIN-EATERS and PIGEONS; subsequently abandoned by him; but in the meanwhile brought forward by Prof. Lilljeborg (*Proc. Zool. Soc.* 1866, pp. 11, 15), with the addition of the MEGAPODES and omission of *Menura* and *Musophagidæ*.

PURRE (A.S. *Pur*, Wright's *Vocabularies*, i. p. 21), a common name for the DUNLIN in its winter-dress, especially among professional gunners, who are apt to believe, as did ornithologists for a long while, that the Purre and the Dunlin are distinct species.

PUTTOCK, an old name for the KITE and BUZZARD, suggested by Prof. Skeat (*Etymol. Dict.* p. 480) to signify *Poot-* or *Poult-Hawk*, that is to say the Hawk that especially preys on the young of Gallinaceous birds.

PYGOPODES, Illiger's name in 1811 for a group consisting of the genera *Colymbus* (= *Podicipes*, GREBE), *Eudytes* (= *Colymbus*, DIVER), *Uria* (GUILLEMOT), *Mormon* (PUFFIN), and *Alca* (AUK), and by many writers regarded as a reasonably natural group or Order.

PYGOSTYLE is the terminal bony expansion of the last 6 or 7 caudal vertebræ which in almost all *Carinatæ* coalesce into a subtriangular upright plate or blade carrying the RECTRICES. *Archæopteryx* (pp. 278-279) shews the most primitive condition by possessing about 21 free post-sacral vertebræ, of which each, from the 9th to the 20th, supports a pair of well-developed rectrices. In all other Birds, as yet known, the number of post-sacral vertebræ is considerably diminished, partly by the fusion of about 6 of them with the PELVIS, and partly by reduction at the distal end, so that not more than some 13 caudal vertebræ are left, of which about one-half are free while the rest form the Pygostyle—a result possibly due to the greater use and development of the rectrices. However, *Hesperornis* (pp. 649-650), the *Ratitæ* and *Tinamidæ* retain, even when adult, 13 free vertebræ, which diminish in size towards the tip of the tail, and thus these birds present in that respect an embryonic condition, though it is more probable that in them the absence of a Pygostyle has been brought about in a secondary way by the gradual loss or reduction of once strongly-developed rectrices, than that it should be the retention of a primitive feature. A Pygostyle has been occasionally observed in *Apteryx*, and the specimen of an old Ostrich in the Cambridge Museum has one, some 2 inches high and nearly an inch and a half long. In *Ichthyornis* (p. 651) it is very small. All this tends to shew that the distinction expressed by the term SAURURÆ, in opposition to "*Ornithuræ*," is based on an erroneous supposition.

PYLSTAART, from the Dutch, signifying a tail like the shaft of an arrow, and apparently applied originally to the long-tailed SKUAS, but now more frequently to the TROPIC-BIRDS.

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QUA-BIRD, so-called from its cry, one of the names given to the North-American Night-HERON, *Nycticorax nævius* (page 420).

QUADRATE BONES form in Birds, as in Reptiles, Amphibians and Fishes, the suspensorial apparatus of the mandibles, while in Mammals they are transformed into the tympanic ring and lose their jaw-bearing function. The dorsal or proximal end of the Quadrate invariably articulates with the squamosal, and often with the lateral occipital bone also. In *Hesperornis*, *Ichthyornis*, *Ratitæ* and *Tinamidæ* the articulation is formed by a single convexity, while in all other birds it consists of an outer and an inner knob, though the existence of an inner knob, small and sometimes indistinct, is indicated in *Hesperornis*, *Rhea* and the *Peristeropodes*. The ventral or distal end of the Quadrate has two oblong knobs for articulation with the mandible, as well as two small facets, one on the lateral side for the jugal bone, and the other, which is prominent, on the median side for articulation with the posterior end of the PTERYGOID. From the anterior surface of the shaft of the Quadrate projects the orbital process serving for the attachment of one of the masseter muscles. This process differs greatly in various birds, being large and strong in most aquatic forms, pointed in the Birds-of-Prey and scarcely developed in the Nightjars. Since, as in Lizards and Snakes, the whole Quadrate is movable, protrusion of its distal end helps, by means of the jugal bone, to raise the upper jaw (*cf.* SKULL). That the general shape of the Quadrate can be advantageously used for taxonomic purposes has been shewn by the excellent figures of Miss M. Walker (*Stud. Mus. Dundee*, 1888).

QUAIL (Old Scottish *Quailzie*, Old French *Quaille*, Mod. French *Caille*, Italian *Quaglia*, Low Latin *Quaquila*, Dutch *Kwakkel* and *Kwartel*, German *Wachtel*, Danish *Vagtel*), a very well-known bird throughout almost all countries of Europe, Asia and Africa,—in modern ornithology the *Coturnix communis* or *C. dactylisonans.*

This last epithet was given from the peculiar three-syllabled call-note of the cock, which has been grotesquely rendered in several European languages, and in some parts of Great Britain the species is popularly known by the nickname of "Wet-my-lips" or "Wet-my-feet." The Quail varies somewhat in colour, and the variation is rather individual than attributable to local causes; but generally the plumage may be described as reddish-brown above, almost each feather being transversely patched with dark brown interrupted by a longitudinal stripe of light buff; the head is dark brown above, with three longitudinal streaks of ochreous-white; the sides of the breast and flanks are reddish-brown, distinctly striped with ochreous-white; the rest of the lower parts are pale buff, clouded with a darker shade, and passing into white on the belly. The cock, besides being generally brighter in tint, not unfrequently has the chin and a double throat-band of reddish or blackish-brown, which marks are wanting in the hen, whose breast is usually spotted. Quails breed on the ground, without making much of a nest, and lay from nine to fifteen eggs of a yellowish-white, blotched and spotted with dark brown. Essentially migratory by nature,[1] in March and April they cross the Mediterranean from the south on the way to their breeding-homes in large bands, but these are said to be as nothing compared with the enormous flights that emigrate from Europe towards the end of September. During both migrations immense numbers are netted for the market, since they are almost universally esteemed as delicate meat. On capture they are placed in long, narrow and low cages, darkened to prevent the prisoners from fighting, and, though they are often so much crowded as to be hardly able to stir, the loss by death that ensues is but trifling. Food, usually millet or hemp-seed, and water are supplied in troughs hung in front, and thus these little birds are transported by tens of thousands from the shores of the Mediterranean for consumption in the most opulent and populous cities of Europe. The flesh of Quails caught in spring commonly proves dry and indifferent, but that of those taken in autumn, especially when they have been kept long enough to grow fat, as they quickly do, is excellent. In no part of the British Islands at present do Quails exist in sufficient numbers to be the especial object of sport, though there are many places in which a few, and in some seasons more than a few, yearly fall to the gun. When made to take wing, which is not always easily done, they rise with great speed, but on such occasions they seldom fly far, and no one seeing them only thus would be inclined to credit them with the power of extensive migration that they possess, though this is often overtaxed, and the birds in their transmarine voyages frequently drop exhausted into the sea or on any vessel that may be in their way. In old days they were taken in England in a net, attracted thereto by means of a Quail-call,—a simple instrument,[1] the use of which is now wholly neglected,—on which their notes are easily imitated.

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[1] Yet not a few Quails pass the winter in the northern hemisphere and even in Britain, and many more in southern Europe.

Five or six other species of the restricted genus *Coturnix* are now recognized; but the subject of the preceding remarks is generally admitted to be that intended by the author of the book of Exodus (xvi. 13) as having supplied food to the Israelites in the wilderness, though a few writers have thought that bird to have been a SAND-GROUSE. In South Africa and India allied species, *C. delegorguii* and *C. coromandelica*, the latter known as the Rain-Quail, respectively occur, as well as the commoner one, which in Australia and Tasmania is wholly replaced by *C. pectoralis*, the Stubble-Quail of the colonists. In New Zealand another species, *C. novæ-zealandiæ*, was formerly very abundant in some districts, but is considered to have been nearly if not quite extirpated within the last thirty years by bush-fires. Some fifteen or perhaps more species of Quails, inhabiting the Indian and Australian Regions, have been separated, perhaps unnecessarily, to form the genera *Synœcus*, *Perdicula*, *Excalphatoria* and so forth; but they call for no particular remark.

America has some forty species of birds which are commonly deemed Quails, though by some authors placed in a distinct Family or subfamily *Odontophorinæ*.[2] The best known is the Virginian Quail, or COLIN, as it is frequently called—that being, according to Hernandez, its old Mexican name. It is the *Ortyx virginianus* of modern ornithology, and has a wide distribution in North America, in some parts of which it is known as the "Partridge," as well as by the nickname of "Bob-White,"[3] aptly bestowed upon it from the call-note of the cock. Many attempts have been made to introduce this bird to England (as indeed similar trials have been made in the United States with Quails from Europe); but, though it has been turned out by hundreds, and has been frequently known to breed after liberation, its numbers rapidly diminish until it wholly disappears. The beautiful tufted Quail of California, *Lophortyx californicus*, has also been tried in Europe without success; but is well established in New Zealand and the Sandwich Islands. All these American Quails or Colins seem to have the habit of perching on trees, which none of the Old-World forms possess.

Interesting from many points of view as is the group of Birds last mentioned, there is another which, containing a score of species (or perhaps more) often termed Quails, is of still greater importance in the eyes of the systematist. This is that comprehended by the genus *Turnix* (HEMIPODE). It is characteristic of this genus to want the hind toe; but the African *Ortyxelus* and the Australian *Pedionomus* which have been referred to its neighbourhood have four toes on each foot, and, though nothing is known of the anatomy or habits of the first, the second, after much discussion, has been decisively shewn by Dr. Gadow (*Rec. Austral. Mus.* 1891, pp. 205-211) to be closely allied to *Turnix*.

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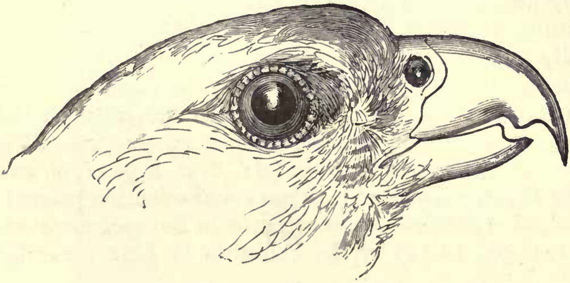
[1] One is figured in Rowley's *Ornithological Miscellany* (ii. p. 363).

[2] They form the subject of a monograph in folio by Gould, published between 1844 and 1850.

[3] I learn from a kindly critic (*Auk*, 1893, p. 358) that this name has lately been adopted as generic.

QUAIL-DOVE and QUAIL-SNIPE, both book-names—the former for *Starnœnas cyanocephala* a Cuban species which occasionally strays to the Florida Cays, and the latter for species of the Neotropical genus *Thinocorys*, one of the LIMICOLÆ, by some writers referred to the *Charadriidæ* (PLOVER, p. 733), and by others regarded as forming with *Attagis* a self-standing Family.

QUAIL-HAWK, the name given by colonists to the *Falco novæ-zealandiæ* of Gmelin, by later writers referred to the genus *Hieracidea* or even placed apart as *Harpe*,[1] a fine Falconine bird, the precise affinities of which it would be very interesting to know, and one must hope that they may be determined before the extirpation of the form, since there seems to be a chance of its proving to be a less modified descendant of an ancient stock whence the true genus *Falco* and others have sprung, while on the other hand it may turn out to be only an early settler from Australia or elsewhere. Several authorities, and among them Sir Walter Buller, recognize a second species, the *Falco ferox* of Peale or *brunneus* of Gould, which seems scarcely to differ from the first but in its smaller size, its habit of frequenting the bush rather than the open, and its comparative abundance in the North Island, where the



QUAIL-HAWK. (From Buller.)

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[1] This name has long been preoccupied by conchologists, and that in the very form, *Harpa*, to which Dr. Sharpe (*Cat. B. Br. Mus.* i. p. 372) changed it.

larger one is seldom if ever seen. Both appear to be equally courageous, and their thoroughly Falconine aspect is shewn by the annexed figure.

QUAKER, a sailors' name for the Dusky Albatros, *Phœbetria fuliginosa.*

QUAKETAIL, a book-name invented for the Yellow WAGTAIL and its allies, after they had been generically separated from *Motacilla* as *Budytes.*

QUAM or QUAN, old ways of spelling what is now written GUAN.

QUA-QUA, the Creole name in Tobago, for a species of *Thamnophilus* (ANT-THRUSH, p. 21) there found.

QUEEST or QUIST, an abbreviated corruption of CUSHAT.

QUESAL or QUEZAL the Spanish-American name for one of the most beautiful of birds, abbreviated from the Aztec or Maya *Quetzal-tototl*, the last part of the compound word meaning fowl, and the first, also written *Cuetzal*, the long feathers of rich green with which it is adorned.[1] The Quezal is one of the TROGONS, and was originally described by Hernandez (*Historia*, p. 13), whose account was faithfully copied by Willughby. Yet the bird remained practically unknown to ornithologists until figured in 1825, from a specimen belonging to Leadbeater,[2] by Temminck (*Pl. col.* 372) who, however, mistakenly thought it was the same as the *Trogon pavoninus*, a congeneric but quite distinct species from Brazil, that had just been described by Spix (*Av. Bras.* i. p. 47, pl. xxxv.) In 1832 the *Registro Trimestre*, a literary and scientific journal printed at Mexico, of which few copies can exist in Europe, contained a communication (pp. 43-49) by Dr. Pablo de la Llave, describing this

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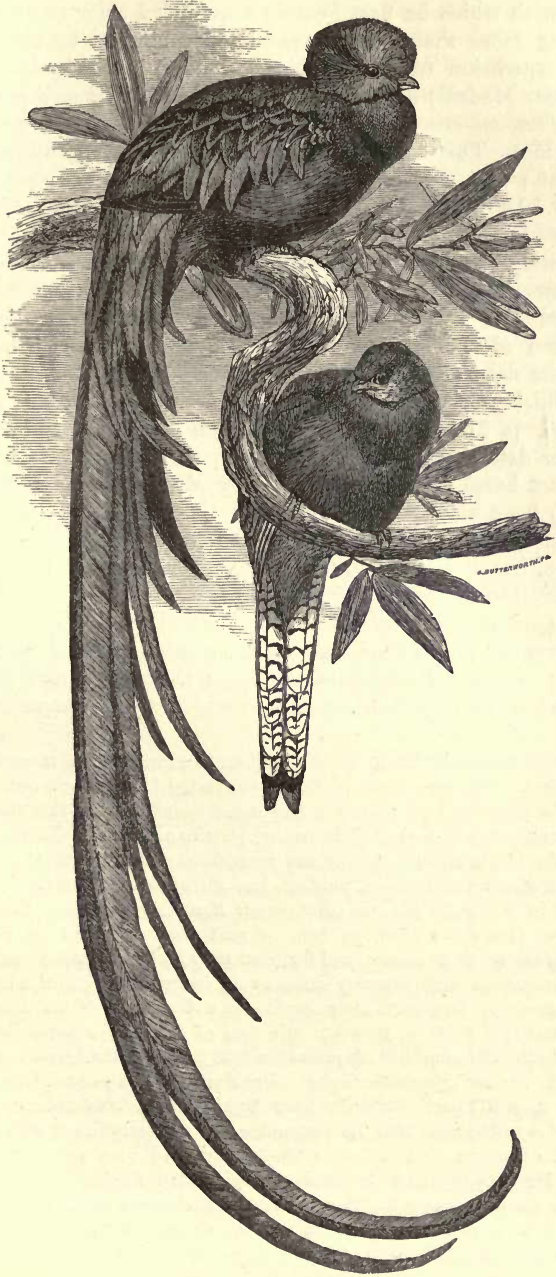
[1] Dr. Tylor informs me that the Mexican deity Quetzal-coatl had his name, generally translated "Feathered Snake," from the *quetzal*, feather or bird, and *coatl*, snake, as also certain kings or chiefs, and many places, *e.g.* Quetzalapan, Quetzaltepec, and Quezaltenango, though perhaps some of the last were named directly from the personages (*cf.* Bancroft, *Native Races of the Pacific States*, vol. v. Index). Quetzal-itzli is said to be the emerald.

[2] This specimen had been given to Mr. Canning (a tribute, perhaps, to the statesman who afterwards boasted that he had "called a New World into existence to redress the balance of the Old") by Mr. Schenley, a diplomatist, and was then thought to be unique in Europe; but, apart from those which had reached Spain, where they lay neglected and undescribed, James Wilson says (*Illustr. Zool.* pl. vi. text) that others were brought with it, and that one of them was given to the Edinburgh Museum. On the 21st day of the sale of Bullock's Museum in 1819, Lot 38 is entered in the Catalogue as "The Tail Feather of a magnificent undescribed Trogon," and very likely belonged to this species. It was bought for nineteen shillings by Warwick, a well-known London dealer.


G. BUTTERWORTH. SC

Quezal, male and female.

species (with which he first became acquainted prior to 1810, from examining more than a dozen specimens obtained by the natural-history expedition to New Spain and kept in the palace of the Retiro near Madrid) under the name by which it is now commonly known, *Pharomacrus mocinno*,[1] in memory of a Mexican naturalist, Dr. Mociño. This fact, however, being almost unknown to the rest of the world, Gould, while pointing out Temminck's error (*Proc. Zool. Soc.* 1835, p. 29), gave the species the name of *Trogon resplendens*, which it bore for some time. Yet little or nothing was generally known about the bird until Delattre sent an account of his meeting with it to the *Echo du Monde Savant* for 1843 (reprinted *Rev. Zool.* for that year, pp. 163-165). In 1860 the nidification of the species, about which strange stories had been told to the naturalist last named, was determined, and its eggs, of a pale bluish-green, were procured by Mr. Robert Owen (*Proc. Zool. Soc.* 1860, p. 374; *Ibis*, 1861, p. 66, pl. ii. fig. 1); while further and fuller details of its habits (of which want of space forbids even an abstract here) were made known by Mr. Salvin (*Ibis*, 1861, pp. 138-149) from his own observation of this very local and remarkable species. Its chief home is in the mountains near Coban in Vera Paz, but it also inhabits forests in other parts of Guatemala at an elevation of from 6000 to 9000 feet.

The Quezal is hardly so big as a Turtle-Dove. The cock has a fine yellow bill and a head bearing a rounded crest of filamentous feathers; lanceolate scapulars overhang the wings, and from the rump spring the long flowing plumes which are so characteristic of the species, and were so highly prized by the natives prior to the Spanish conquest that no one was allowed to kill the bird when taken, but only to divest it of its feathers, which were to be worn by the chiefs alone. These plumes, the middle and longest of which may measure from three feet to three feet and a half, are with the upper surface, the throat and chest, of a resplendent golden-green,[1] while the lower parts are of a vivid scarlet. The middle feathers of the tail, ordinarily concealed, as are those of the Peacock, by the uropygials, are black, and the outer white with a black base. In the hen the bill is black, the crest more round and not filamentous, the uropygials scarcely elongated and the vent only scarlet. The eyes are of a yellowish-brown. Southern examples from Costa Rica and Veragua have the tail-coverts much narrower, and have been needlessly considered to form a distinct species under the name of *P. costaricensis.* There are, however, three good congeneric species, *P. antisianus*, *P. auriceps* and *P. pavoninus*, from various parts of South America, and, though all are beautiful birds, none possesses the wonderful singularity of the Quezal.

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[1] M. Sallé translated De la Llave's very rare and interesting memoir (*Rev. et Mag. de Zool.* 1861, pp. 23-33). Bonaparte stated (*Proc. Zool. Soc.* 1837, p. 101) that in 1826 he had proposed the name *paradiseus* for this species, and had communicated a notice of it to an American journal. There seems no reason to doubt his statement, and the journal was most likely the *Contributions of the Maclurian Lyceum*, published at Philadelphia (1827-29), to which, as he says in his *Sulla seconda edizione del Regno Animale del Barone Cuvier Osservazioni* (Bologna: 1830, p. 80), he sent some remarks on Swainson's *Synopsis of the Birds of Mexico*, and believed they had been printed there. But these *Contributions* unfortunately came to an end with the third number, and the only article by Bonaparte they contain is a *Catalogue of the Birds of the United States* (pp. 8-34), so that his criticism of Swainson's paper (which had appeared in the *Philosophical Magazine* for 1827), though doubtless accepted for publication, has never seen the light. Dr. Hartlaub has printed (*Naumannia*, 1852, Hft. 2, p. 51) part of a letter from Duke Paul of Würtemberg, in which the writer says that in 1831 he communicated a description of *P. mocinno* to Cuvier, who thought that its long train-feathers had been put together artificially. He possibly had in mind the celebrated feather treasured in the Escurial as having come from the wing of the Archangel Gabriel. This might be thought to have been a Quezal's, but the author of *Vathek* who saw it in 1787, says (*Italy with Sketches of Spain*, ii. p. 325) it was rose-coloured.

QUILL, properly that part of FEATHER which is often called the "barrel"; but in common use applied to any feather that has a barrel of considerable size, and especially to the large feathers of the tail and wing (see RECTRICES, REMIGES).

QUILL-TAIL COOT, a local name in North America for *Erismatura rubida,* one of the Spiny-tailed DUCKS (p. 168).

QUINCK-GOOSE, a fowlers' name of the BRANT-GOOSE (pp. 57, 375).

QUISCALUS, said to be from the Low Latin *Quiscula* or *Quisquilla,* which like *Quaquila* are supposed to be renderings of *Quagila* or some such word, and to mean QUAIL, but the first is used as the scientific name of the genus to which belong the BOAT-TAIL GRACKLES, and also occasionally as an English word.

QUIT, a name applied in Jamaica, and perhaps some others of the British Antilles, to several very different kinds of birds, probably from the note they utter (*cf.* GUIT-GUIT). Thus the Banana Quit is the SUGAR-BIRD, the Blue Quit is *Euphonia jamaica,* one of the TANAGERS, the Grass-Quits are species of *Phonipara* allied if not belonging to the *Emberizidæ* (BUNTING), and the Orange-Quit is *Glossoptila ruficollis,* one of the *Cærebidæ.*

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[1] Preserved specimens, if exposed to the light, lose much of their beauty in a few years, the original glorious colour becoming a dingy greenish-blue.

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RACE-HORSE, a name applied by seamen to the LOGGERHEAD Duck (p. 518) for more than a century, but of late years superseded by that of Steamer-Duck.

RACQUET-TAIL, a name given to several of the MOTMOTS, and by Gould to HUMMING-BIRDS of the genus *Spathura*.

RADIUS, the straighter and more slender of the two bones of the forearm (the other being the ULNA). Its proximal end forms a shallow cup for articulation with the outer condyle of the HUMERUS, while the distal end bears a knob which fits into the radial bone of the CARPUS.

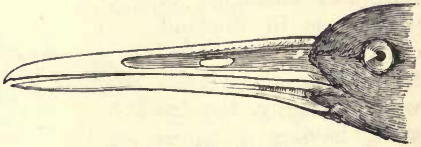
RAFTER-BIRD, a local name of the Spotted FLYCATCHER.

RAIL (German *Ralle*, French *Râle*, Low Latin *Rallus*), originally the English name of two birds, distinguished from one another by a prefix as Land-Rail and Water-Rail, but latterly applied in a much wider sense to all the species which are included in the Family *Rallidæ*.

The LAND-RAIL, also very commonly known as the Corn-Crake, and sometimes as the Daker-Hen, is the *Rallus crex* of Linnæus and *Crex pratensis* of later authors. Its monotonous grating cry, which has given it its common name in several languages, is a familiar sound throughout the summer-nights in many parts of the British Islands; but the bird at that season very seldom shews itself, except when the mower lays bare its nest, the owner of which, if it escape beheading by the scythe, may be seen for an instant before it disappears into the friendly covert of the still-standing grass. In early autumn the partridge-shooter not unfrequently flushes it from a clover-field or tangled hedgerow; and, as it rises with apparent labour and slowly flies away to drop into the next place of concealment, if it fall not to his gun, he wonders how so weak-winged a creature can ever make its way to the shores if not to the interior of Africa, whither it is almost certainly bound; for, with comparatively few individual exceptions, the Land-Rail is essentially migratory—nay more than that, it is the *Ortygometra* of classical authors—supposed by them to lead the QUAIL on its voyages—and in the course of its wanderings has now been known to reach the coast of Greenland, and several times that of North America, to say nothing of Bermuda, in every instance we may believe as a straggler from Europe or Barbary. An example has even been recorded from New South Wales (*Rec. Austral. Mus.* ii.

p. 82). The Land-Rail needs but a brief description. It looks about as big as a Partridge, but on examination its appearance is found to be very deceptive, and it will hardly ever weigh more than half as much. The plumage above is of a tawny brown, the feathers being longitudinally streaked with blackish-brown; beneath it is of a yellowish-white; but the flanks are of a light chestnut. The species is very locally distributed, and in a way for which there is at present no accounting. In some dry upland and corn-growing districts it is plentiful; in others, of apparently the same character, it but rarely occurs; and the same may be said in regard to low-lying marshy meadows, in most of which it is in season always to be heard, while in others having a close resemblance to them it is never met with. The nest is on the ground, generally in long grass, and therein from nine to eleven eggs are commonly laid. These are of a cream-colour, spotted and blotched with light red and grey. The young when hatched are thickly clothed with black down, as is the case in nearly all species of the Family.

The Water-Rail, locally known by several names as Bilcock or Skiddy, is the *Rallus aquaticus* of Ornithology, and seems to be less abundant than the preceding, though that is in some measure due to its frequenting places into which from their swampy nature men do not often intrude. Having a general resemblance to the Land-Rail,[1] it can be in a moment distinguished by its partly red and much longer bill, and the darker coloration of its plumage—the upper parts being of an olive-brown with black streaks, the breast and belly of a sooty-grey, and the flanks dull black barred with white. Its geographical distribution is very wide, extending from Iceland (where it is said to preserve its existence during winter by resorting to the hot springs) to China; and though it inhabits Northern India, Lower Egypt and Barbary, it seems not to pass beyond the tropical line. It never affects upland districts as does the Land-Rail, but always haunts wet marshes or the close vicinity of water. Its love-note is a loud and harsh cry, not continually repeated as is that of the Land-Rail, but uttered at considerable intervals and so suddenly as to have been termed "explosive." Besides this, which is peculiar to the cock-bird, it has a croaking call that is frog-like. The eggs resemble those of the preceding, but are more brightly and delicately tinted.



Rallus. (After Swainson.)

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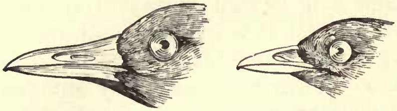
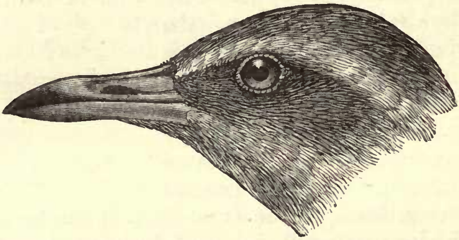
[1] Formerly it seems to have been a popular belief in England that the Land-Rail in autumn transformed itself into a Water-Rail, resuming its own character in spring. I have met with several persons of general intelligence who had serious doubts on the subject.

The various species of Rails, whether allied to the former or latter of those just mentioned, are far too numerous to be here noticed. Hardly any part of the world is without a representative of the genera *Crex* or *Rallus*, and every considerable country has one or perhaps more of each—though it has been the habit of systematists to refer them to many other genera, the characters of which are with difficulty found. Thus in Europe alone three other species allied to *Crex pratensis* occur more or less abundantly; but one of them, the Spotted Rail or Crake, has been made the type of a so-called genus *Porzana*, and the other two, little birds not much bigger than Larks, are considered to form a genus *Zapornia*. The first of these, which used not to be uncommon in the eastern part of England, has a very near representative in the Carolina Rail or Sora, *Crex carolina*, of North America, often there miscalled the Ortolan, just as its European analogue, *C. porzana*, is in England often termed the Dotterel. Then there is the widely-ranging *Hypotænidia*, having a representative almost everywhere from India to China, and far away among the islands to the south-east, even to New Zealand, while at least one example has been known to reach Mauritius. But, passing over these as well as some belonging to genera that can be much better defined, as the COOT and MOOR-HEN, to say nothing of other still more interesting forms of the Family, as the already extinct *Aphanapteryx* and *Erythromachus*[1] (EXTERMINATION, pp. 217, 218), *Ocydromus* (WEKA) and certain other members of the Family which there is reason to think are doomed to extirpation, brief notice must be taken of the curious genus *Mesites* of Madagascar, which has been referred by Prof. Alphonse Milne-Edwards (*Ann. Sc. Nat.* ser. 6, vii. art. 2) to the neighbourhood of the Rails, though offering some points of resemblance to the Herons.[2] On the



PORZANA. ZAPORNIA.

(After Swainson.)



HYPOTÆNIDIA. (From Buller.)

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[1] By an oversight this genus was called *Miserythrus* in the passage quoted. (For it see *Proc. Zool. Soc.* 1875, p. 41.)

[2] The FINFOOTS and JACANAS, by some systematists formerly placed with the *Rallidæ*, to which the former certainly have some affinity, should be regarded as forming distinct Families, *Heliornithidæ* and *Parridæ*. The

whole the *Rallidæ* constitute a group of birds which, particularly as regards their relations to some other remarkable forms, of which the SUN-BITTERN, *Eurypyga*, and KAGU, *Rhinochetus*, may especially be named, well deserve greater attention from the systematist, and any ornithologist in want of a subject could hardly find one more likely to reward his labours if he were only to carry them out in a judicious way. Based on the safe ground of anatomy, but due regard being also had to the external characters, habits and other peculiarities of this multifarious group, a monograph might be produced of surpassing interest, and one that in its bearings on the doctrine of evolution would be likely to prove a telling record.[1]

RAIN-BIRD, RAIN-GOOSE and RAIN-QUAIL, the first applied in England locally to the Green WOODPECKER, but in Jamaica to CUCKOWS of the genera *Piaya* and *Saurothera*; the second in Orkney to the DIVERS, and preferably to *Colymbus septentrionalis*; the third in India to *Coturnix coromandelica*, because of its abundance in some parts of the country during the rainy season; but the others seem to be used because the birds in question are supposed to predict rain by their frequent cries.

RAPACES, RAPTATORES, RAPTORES, names proposed for the Order containing the Birds-of-Prey (both diurnal and nocturnal), and therefore nearly equivalent to the ACCIPITRES of Linnæus. The first was conferred in 1777 by Scopoli (*Introd. Hist. Nat.* p. 478), and included the genera *Strix*, *Falco*, *Vultur*, *Buceros* and *Rhamphastos*. Temminck adopted it, properly excluding the last two, and gave it currency. The second name was invented in 1811 by Illiger (*Prodr. System.* p. 194), who so termed his Third Order, consisting of the genera *Strix*, *Falco*, *Gypogeranus*, *Gypaetus*, *Vultur* and *Cathartes*; and the third, being only a grammatical alteration of the second, by Vigors in 1823 (*Trans. Linn. Soc.* xiv. p. 405, note). No one of the three is used by the latest taxonomers of repute.

RASORES, Illiger's name in 1811 (*Prodr. System.* p. 195) for his Fourth Order, made to contain 5 Families:—(1) *Gallinacei*, with the genera *Numida*, *Meleagris*, *Penelope*, *Crax*, *Opisthocomus*, *Pavo*, *Phasianus*, *Gallus*, *Menura*, *Tetrao* and *Perdix*; (2) *Epollicati*, composed of *Ortygis* (= *Turnix*) and *Syrrhaptes*; (3) *Columbini*, consisting

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LIMPKIN, *Aramus*, also, though its position is not so decided can hardly be kept among the Rails. Mr. W. H. Hudson's notes on the habits of these birds, which he (*Proc. Zool. Soc.* 1876, pp. 102-109) considers to be Rails, as well as others that undoubtedly are so, deserve the best attention.

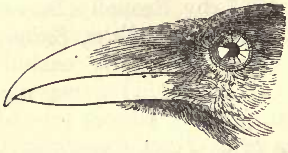
[1] The most recent revision of the *Rallidæ* is that by Dr. Sharpe (*Cat. B. Br. Mus.* xxiii. pp. 1-228), who has found it necessary to recognize 61 genera.

of *Columba*; (4) *Crypturi* of *Crypturus* (=*Tinamus*); and (5) *Inepti* of *Didus*.

RATITÆ, that division of the Class AVES whose sternum developing no "keel" resembles a raft or flat-bottomed boat (*ratis*), and accordingly so named by Merrem (*Abhandl. Akad. Wissensch. Berlin*, 1812-13, *Physik. Kl.* p. 259) in contradistinction to his CARINATÆ (p. 76), though to it he admitted only the single genus *Struthio*. The extraordinary neglect of this important distinction is elsewhere dwelt upon (INTRODUCTION), and to Prof. Huxley (*Proc. Zool. Soc.* 1867, p. 418) is due the full recognition of Merrem's merits. According to the views[1] adopted in this volume the Subclass *Ratitæ* comprehends of existing forms the Orders *Apteryges* (KIWI), *Megistanes* (CASSOWARY, EMEU), *Rheæ* (RHEA) and *Struthiones* (OSTRICH), together with the extinct *Æpyornithes* (ROC) and *Immanes* (MOA). As regards the relation of other older forms to the *Ratitæ* it seems best at present to use reserve (see FOSSIL BIRDS, ODONTORNITHES and STEREORNITHES).

RATTLE-WINGS, a fowlers' name for the GOLDEN-EYE (p. 369).

RAVEN (Anglo-Saxon *Hræfn*, Icelandic *Hrafn*, Danish *Ravn*, Dutch *Raaf*, German *Rabe*), the largest of the Birds of the Order *Passeres*, and probably the most highly developed of all Birds. Quick-sighted, sagacious and bold, it must have followed the prehistoric fisher and hunter, and generally without molestation from them, to prey on the refuse of their spoils, just as it now waits, with the same intent, on the movements of their successors; while it must have likewise attended the earliest herdsmen, who could not have regarded it with equal indifference, since its now notorious character for attacking and putting to death a weakly animal was doubtless in those days manifested. Yet the Raven is no mere dependent upon man, being always able to get a living for itself; and moreover a sentiment of veneration or superstition has from very remote ages and among many races of men attached to it—a sentiment so strong as often to overcome the feeling of distrust not to say of hatred which its deeds inspired, and, though rapidly decreasing, even to survive in some places until the present time.[2]



RAVEN. (After Swainson.)

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[1] See *Ann. and Mag. Nat. Hist.* ser. 4, xx. pp. 499, 500.

[2] There is no need to dwell on the association of this bird with well-known characters of history sacred or profane—Noah or Elijah, Odin or Flokki, the last of whom by its means discovered Iceland. The Raven is even said to have

Notwithstanding all this, however, the Raven has now fallen upon evil days. The reverence with which it was once regarded has all but vanished, and has been very generally succeeded by persecution, which in many districts has produced actual extirpation, so that it is threatened with extinction, save in the wildest and most unpeopled districts.[1]

The Raven breeds very early in the year, in England resorting to its nest, which is usually an ancient if not an ancestral structure, about the middle or towards the end of January. Therein are laid from five to seven eggs of the common Corvine coloration, and the young are hatched before the end of February. In more northern countries the breeding-season is naturally delayed, but everywhere this species is almost if not quite the earliest of birds to enter upon the business of perpetuating its kind. The Raven measures about 26 inches in length, and has an expanse of wing considerably exceeding a yard. Its bill and feet are black, and the same may be said of its whole plumage, but the feathers of the upper parts as well as of the breast are very glossy, reflecting a bright purple or steel-blue.[2] The species inhabits the whole of Europe, and the northern if not the central parts of Asia; but in the latter continent its southern range is not well determined. In America[3] it is, or used to be, found from the shores of the Polar

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played its part in the mythology of the Red Indian; and none can wonder that all this should be so, since, wherever it occurs and more especially wherever it is numerous, as in ancient times and in thinly-peopled countries it must have been, its size, appearance and fearless habits would be sure to attract especial attention. Nor has this attention wholly ceased with the advance of enlightenment, for both in prose and verse, from the time of Shakespear to that of Poe and Dickens, the Raven has often figured, and generally without the amount of misrepresentation which is the fate of most animals which celebrated writers condescend to notice.

[1] That all lovers of nature should take what steps they can to arrest this sad fate is a belief which I strongly hold. Without attempting to deny the loss which in some cases is inflicted upon the rearers of cattle by Ravens, it is an enormous mistake to suppose that the neighbourhood of a pair of these birds is invariably detrimental. On this point I can speak from experience. For many years I had an intimate knowledge of a pair occupying an inland locality surrounded by valuable flocks of sheep, and abounding in rabbits and game, and had ample opportunities, which I never neglected, of repeatedly examining the pellets of bones and *exuviæ* that these, like all other carnivorous birds, cast up. I thus found that this pair of Ravens fed almost exclusively on Moles. Soon after I moved from the neighbourhood in which they lived the unreasoning zeal of a gamekeeper (against, it is believed, the orders of his master) put an end to this interesting couple—the last of their species which inhabited the county.

[2] Pied examples are not at all uncommon in some localities and wholly white varieties are said to have been seen.

[3] American birds have been described as forming a distinct species under

Sea to Guatemala if not to Honduras, but is said hardly to be found of late years in the eastern part of the United States. In Africa its place is taken by three allied but well-differentiated species, two of which (*Corvus umbrinus*, readily distinguished by its brown neck, and *C. affinis*,[1] having its superior nasal bristles upturned vertically) also occur in South-Western Asia, while the third (*C. leptonyx* or *C. tingitanus*, a smaller species characterized by several slight differences) inhabits Barbary and the Atlantic Islands. Further to the southward in the Ethiopian Region three more species appear, whose plumage is varied with white—*C. scapulatus*, *C. albicollis* and *C. crassirostris*—the first two of small size, but the last rivalling the real Raven in that respect.

RAZORBILL or **RAZOR-BILLED AUK**, known also on many parts of the British coasts as the Marrot, Murre, Scout, Tinker, or Willock—names which it, however, shares with the GUILLEMOT, and to some extent with the PUFFIN—a common sea-bird of the Northern Atlantic,[2] but not having a very high northern range, resorting in vast numbers to certain stations on rocky cliffs for the purpose of breeding, and, its object being accomplished, returning to deeper waters for the rest of the year. It is the *Alca torda* of Linnæus[3] and most modern authors, congeneric with the GARE-FOWL, if not the true Guillemots, between which two forms it is intermediate—differing from the former in its small size and in retaining the power of flight, which that had lost, and from the latter in its peculiarly-shaped bill, which is vertically enlarged, compressed and deeply furrowed, as well as in its elongated, wedge-shaped tail. A fine white line, running on each side from the base of the culmen to the eye, is in the adult bird in breeding-

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the name of *Corvus carnivorus*, *C. cacolotl* or *C. principalis*, of which there are several forms, and the myology of one, the Mexican *C. sinuatus*, is the subject of a volume by Dr. Shufeldt published in New York and London in 1890.

[1] Dr. Sharpe (*Cat. B. Brit. Mus.* iii. p. 45) separates *C. affinis* as forming a distinct genus *Rhinocorax*; but it is a hard task on any reasonable ground to break up the genus *Corvus* as long accepted by systematists.

[2] Schlegel (*Mus. des Pays-Bas, Urinatores*, p. 14) records an example from Japan; but this must be an error.

[3] The word *Alca* is simply the Latinized form of this bird's common Teutonic name, *Alke*, with which Auk is the English cognate term. It must therefore be held to be the type of the Linnæan genus *Alca*, though some systematists on indefensible grounds have removed it thence, making it the sole member of a genus named by Leach, after Aldrovandus (*Ornithologia*, bk. xix. chap. xlix.), *Utamania*—an extraordinary word, that seems to have originated in some mistake from the equally mistaken *Vuttamaria*, given by Belon (*Observations*, livr. i. ch. xi. (as the Cretan name of some diving bird (which certainly could not have been the present species) and, as Mr. H. F. Tozer has kindly informed me, it should have been written *Vutanaria*, that being the proper transliteration of the Modern Greek *βουταναρία*, a diver—from *βουτίζω*, *mergo*.

apparel (with a few very rare exceptions) a further obvious characteristic. Otherwise the appearance of all these birds may be briefly described in the same words—head, breast and upper parts generally of a deep glossy black, and the lower parts and tip of the secondaries of a pure white, while the various changes of plumage dependent on age or season are alike in all. In habits the Razorbill closely agrees with the true Guillemots, laying its single egg (which is not, however, subject to the same amazing variety of coloration that is pre-eminently the Guillemot's own) on the ledges of the cliffs to which it repairs in the breeding-season, but it is said, as a rule, when not breeding, to keep further out to sea. On the east side of the Atlantic the Razorbill has its stations on convenient parts of the coast from the North Cape to Britanny, besides several in the Baltic, while in winter it passes much further to the southward, and is sometimes numerous in the Bay of Gibraltar, occasionally entering the Mediterranean but apparently never extending to the eastward of Sicily or Malta. On the west side of the Atlantic it breeds from 70° N. lat. on the eastern shore of Baffin's Bay to Cape Farewell, and again on the coast of America from Labrador and Newfoundland to the Bay of Fundy, while in winter it reaches Long Island.

RECOLLET, the name given by the French-speaking population of Canada to *Ampelis cedrorum* (CEDAR-BIRD), from the resemblance of its occipital tuft to the hood worn by members of the Franciscan order of friars.

RECTRICES, the quill-FEATHERS of the tail in Birds, so called from their action in directing FLIGHT. They grow in pairs;[1] and what seems to have been their original arrangement is shewn by *Archæopteryx* (FOSSIL BIRDS, pp. 278, 279).[2] Crowding upon a shorter basis seems to have produced the fan-shaped tail and PYGOSTYLE of most recent birds. Absence of this last implies an irregular arrangement of the tail-feathers, which in such cases, as among the RATITÆ and TINAMOUS, can scarcely be called Rectrices; but the reverse does not always occur, as witness those of the GREBES and PENGUINS. The normal number of Rectrices is 6 pairs, but a few birds possess 10 or 11; several 9, 8 or 7; many only 5, and *Crotophaga* (ANI) only 4—the diminution being brought about by the suppression of the outer pair or pairs, as is indicated by their often dwindling dimensions, as may be seen in the WOODPECKERS and WRYNECKS when compared with the BARBETS

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[1] Where an odd number is found, as not rarely happens in SWANS and some other birds, it seems not unreasonable to suppose that through an injury the germ of one of them has perished.

[2] It was there incorrectly stated that each of the 20 vertebræ bore a pair of rectrices, whereas only 12 of them are so furnished.

(*Capito*) on the one hand and the PUFF-BIRDS (*Monacha*) on the other. Though the smaller number may be a later and higher stage of the tail's development, it certainly does not confer a higher morphological rank on the forms that bear it, as is shewn by the fact that the majority of PICARIÆ have but 5 pairs, and also some of the lower PASSERES as *Acanthidositta* and *Xenicus*, while it is certain that the possession of more than 6 pairs is not an ancestral feature, the increase being a comparatively recent acquisition. Indeed the number of Rectrices seems to have but little signification, very nearly-allied species differing in this respect. Thus of *Oreocincla* (THRUSH) two species have 7 pairs, and all the rest 6. Among the CORMORANTS the common *Phalacrocorax carbo* has 7 pairs and the smaller *P. graculus* (SHAG) 6 pairs. Still greater diversity obtains among the SNIPES, the ordinary species of the Old World, *Gallinago cælestis*, has 7, that of North America, *G. wilsoni* (otherwise not readily distinguished from the former) has 8, as also has *G. major*, while *G. gallinula*, the Jack Snipe, but 6, though in the last two cases accompanied by osteological differences, and the Pin-tailed Snipe of Asia, *G. stenura*, sometimes exhibits 14 pairs. Several other similar cases are on record and many must exist that have not been detected. A difference too may depend upon sex, as with the PEACOCK, which has 10 pairs, being one more than the Peahen.

Of the varied forms and functions of the Rectrices there is little need to speak. The differences displayed by the first are obvious to all who have the least acquaintance with Birds. The forked tail of a SWALLOW is proverbial, and the pointed tail of a PARAKEET hardly less familiar, while the erect tail of the Cock with its gallant streamers affords a striking contrast to the flattened tail of the Goose that feeds beside him in the poultry-yard. Similarly as to function: in the Peacock, QUEZAL and some other birds the rectrices serve but as a support to the showy train that covers and hides them: in the WOODPECKERS, TREE-CREEPERS, and many forms not allied to either, they are of the greatest importance in the bird's economy, as without their support it would be unable to obtain a living; but many are the cases in which ingenuity is at a loss to assign the reason for some remarkable peculiarity offered by the Rectrices.

RECTUM, the portion of the intestine (DIGESTIVE SYSTEM, p. 138) between the insertion of the CÆCA and the CLOACA. Birds, the *Ratitæ* and *Palamedea* excepted, have no colon, and the Rectum descending along the right KIDNEY is generally shorter than the distance from the upper end of the kidneys to the cloaca. In the Ostrich, however, it is of enormous length (p. 140) and width.

REDBACK, a name applied in North America to the DUNLIN of that country, *Tringa americana* (p. 172); but at best only applicable to it in summer-plumage.

REDBIRD, a name of *Cardinalis virginianus* (CARDINAL), and with the prefix "Summer" of a species of TANAGER, *Pyranga æstiva*, since it occurs at that season only within the United States of America.

REDBREAST, the name of a bird which from its manners, no less familiar than engaging, has for a long while been so great a favourite among all classes in Great Britain as to have gained an almost sacred character. The pleasing colour of its plumage—one striking feature of which is expressed by its ancient name—its sprightly air, full dark eye, enquiring and sagacious demeanour, added to the trust in man it often exhibits, but, above all, the cheerful sweetness of its song, even "when winter chills the day" and scarce another bird is heard—combine to produce the effects just mentioned, so that among many European nations it has earned some endearing name, though there is no country in which "Robin Redbreast" is held so highly in regard as England.[1] Well known as is its appearance and voice throughout the whole year in the British Islands, there are not many birds which to the attentive observer betray more unmistakably the influence of the migratory impulse; but somewhat close scrutiny is needed to reveal this fact. In the months of July and August the hedgerows of the southern counties of England may be seen to be beset with Redbreasts, not in flocks as is the case with so many other species, but each individual keeping its own distance from the next[2]—all, however, pressing forward on their way to cross the Channel. On the European continent the migration is still more marked, and the Redbreast on its autumnal and vernal passages is the object of hosts of bird-catchers, since its value as a delicacy for the table has long been recognized.[3] But even those Redbreasts which stay in Britain during the winter are subject to a migratory movement easily perceived by any one that will look out for it. Occupying during autumn their usual haunts in outlying woods or hedges, the first sharp frost at once makes them change their habitation, and a heavy fall of snow drives them towards the homesteads for such food as they may find there, while, should severe weather continue long and sustenance become more scarce, even these stranger birds disappear—most of them possibly to perish—leaving only the few that have already become almost domiciled among men. On the approach of spring the accustomed spots are revisited, but among the innumerable returning denizens Redbreasts are apt to be neglected, for their song not being powerful is drowned or lost, as Gilbert White well remarked, in the general chorus.

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[1] English colonists in distant lands have gladly applied the common nickname of the Redbreast to other birds that are not immediately allied to it. The ordinary "ROBIN" of North America is a Thrush, *Turdus migratorius* (FIELDFARE, p. 250), and the BLUEBIRDS of the same continent belonging to the genus *Sialia* in ordinary speech are Blue "Robins"; while the same familiar name is given in the various communities of Australasia to several species of *Petrœca* and its allies, though some have no red breast.

[2] It is a very old saying that *Unum arbustum non alit duos Erithacos*—one bush does not harbour two Redbreasts.

[3] Of late years an additional impulse has been given to the capture of this species by the absurd fashion of using its skin for the trimming of ladies' dresses and "Christmas cards."

From its abundance, or from innumerable figures, the Redbreast is too well known to need description, yet there are very few representations of it which give a notion of its characteristic appearance or gestures—all so suggestive of intelligence. Its olive-brown back and reddish-orange breast, or their equivalents in black and white, may be easily imitated by the draughtsman; but the faculty of tracing a truthful outline or fixing the peculiar expression of this favourite bird has proved to be beyond the skill of almost every artist who has attempted its portraiture. The Redbreast exhibits a curious uncertainty of temperament in regard to its nesting habits. At times it will place the utmost confidence in man, and again at times shew the greatest jealousy. The nest, though generally pretty, can seldom be called a work of art, and is usually built of moss and dead leaves, with a moderate lining of hair. In this are laid from five to seven white eggs, sprinkled or blotched with light red.

Besides the British Islands, the Redbreast (which is the *Motacilla rubecula* of Linnæus and the *Erithacus rubecula* of modern authors) is generally dispersed over the continent of Europe, and is in winter found in the oases of the Sahara. Its eastern limits are not well determined. In Northern Persia it is replaced by a very nearly allied form, *Erithacus hyrcanus*, distinguishable by its more ruddy hues,[1] while in Northern China and Japan another species, *E. akahige*, is found of which the sexes differ somewhat in plumage—the cock having a blackish band below his red breast, and greyish-black flanks, while the hen closely resembles the familiar British species—but both cock and hen have the tail of chestnut-red.[2]

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[1] A similar intense coloration distinguishes some of the resident Redbreasts of the Canary Islands (Tristram, *Ibis*, 1890, p. 72), and one of them from Tenerife has been described as distinct under the name *T. superbus* (König, *Journ. f. Orn.* 1889, p. 183, 1890, pl. iii. figs. 1, 2).

[2] A beautiful bird now known to inhabit the Loochoo Islands, the *Sylvia komadori* of Temminck, of which specimens are very scarce in collections, is placed by some writers in the genus *Erithacus*, but whether it has any affinity to the Redbreasts remains to be proved. It is of a bright orange-red above, and

REDCAP, a local name of the GOLDFINCH.

REDHEAD, a name often given by gunners to the male of the POCHARD and of the WIGEON, as well as in North America to a WOODPECKER, *Melanerpes erythrocephalus.*

REDLEG, in England a common name for the French or Red-legged PARTRIDGE (p. 695), *Caccabis rufa*, and occasionally of the REDSHANK (when it is generally used in plural form); but in North America said to be applied to the TURNSTONE.

REDPOLL, a very well-known native of Britain, the *Linota rufescens* of recent authors, for a long while confounded with the *Fringilla linaria* of Linnæus, the Mealy or Stone-Redpoll of English bird-catchers, which last is hardly more than an irregular winter-visitant to this country, while the former, often called by way of distinction the Lesser Redpoll, is resident in Scotland and a great part of England, changing its haunts, however, according to the time of year, and being moreover subject to much variability in the places it affects, without our being able to account for the fact otherwise than on the general supposition that the choice is influenced by the supply of food, just as with the CROSSBILLS, to which in several respects the Redpolls have no small affinity. Thus this pleasing little bird may be found nesting abundantly, for it is of a social disposition, in a locality for perhaps two or three seasons in succession, and then may be altogether wanting for several years, though this is especially observable of it in the more southerly parts of its breeding-range, for in the more northerly it exhibits a greater constancy. The Lesser Redpoll is too well known to need description here, for even those who have not had the happiness of studying its habits afield, especially in the breeding-season (and there are few small birds in this country that afford the observer more enjoyment), must have seen it caged scores of times; but the lively colours which glow upon the cock-bird at liberty are in confinement lost at the first moult and never resumed, so that the very name Redpoll becomes a misnomer—the top of the head changing to dark orange, hardly visible in some lights. The geographical range of the Lesser Redpoll is apparently limited to Western Europe, and it cannot be confidently said to breed except in the British Islands. On the other hand, the Mealy Redpoll, which yearly visits us, though in variable numbers, and seems to be always distinguishable by its call-note as well as by the "mealy" appearance of its back, is much more widely distributed, breeding abundantly throughout northern Scandinavia, though, further to

white beneath, the male, however, having the throat and breast black. Dr. Stejneger (*Proc. U.S. Nat. Mus.* 1886, p. 615) considers it, with another equally scarce species from Japan, to form a separate genus *Icoturus.*

the eastward, what seems to be a recognizably distinct form, *L. exilipes* becomes more frequent if not wholly replacing it. Yet both these forms occur in North America, as well as another, the largest of all, *L. hornemanni*, which has two or three times visited England.[1] A remarkable peculiarity in the Redpolls is the fact ascertained by Wolley in Lapland that the size and especially the length of the bill varies according to the food of the birds, that organ growing inordinately in summer when they are almost wholly insectivorous, and being ground short in winter by the hard seeds that then form their only fare. (See also LINNET.)

REDSHANK, the usual name of a bird—the *Scolopax calidris* of Linnæus and *Totanus calidris* of modern authors—so called in English from the colour of the bare part of its legs, which, being also long, are conspicuous as its flies over its marshy haunts or runs nimbly beside the waters it affects. In suitable localities it is abundant throughout the greater part of Europe and Asia, from Iceland to China, mostly retiring to the southward for the winter, though a considerable number remain during that season along the coasts and estuaries of some of the more northern countries. Before the great changes effected by drainage in England it was a common species in many districts, but at the present day there are very few to which it can resort for the purpose of reproduction. In such of them as remain, its lively actions, both on the ground and in the air, as well as its loud notes, render the Redshank, during the breeding-season, one of the most observable inhabitants of what without its presence would often be a desolate spot, and invest it with a charm for the lover of wild nature. At other times the cries of this bird may be thought too shrill, but in spring the love-notes of the male form what may fairly be called a song, the constantly repeated refrain of which—*leero, leero, leero* (for so it may be syllabled)—rings musically around, as with many gesticulations he hovers in attendance on the flight of his mate; or, with a slight change to a different key, engages with a rival; or again, half angrily and half piteously complains of a human intruder on his chosen ground. The body of the Redshank is almost as big as a Snipe's, but its longer neck, wings and legs make it appear a much larger bird. Above, the general colour is greyish-drab, freckled with black, except the lower part of the back and a conspicuous band on each wing, which are white, while the flight-quills are black, thus producing a very harmonious effect. In the breeding-season the back and breast are mottled with dark brown, but in winter the latter is white. The nest is generally concealed in a tuft of rushes or grass, a little removed from the wettest parts of the swamp whence the bird gets its sustenance, and contains four eggs, usually of a rather warmly-tinted brown with blackish spots or blotches; but no brief description can be given that would point out their differences from the eggs of other birds, more or less akin, among which, those of the LAPWING especially, they are taken and find a ready sale.

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[1] Full details of the Redpolls most likely to be met with by European naturalists will be found in Dresser's *Birds of Europe* (iv. pp. 37-57) and Yarrell's *British Birds* (ed. 4, ii. pp. 133-152); and, resting upon considerable experience, may be recommended as trustworthy. Dr. Sharpe (*Cat. B. Br. Mus.* xii. pp. 245-247) recognizes two "species" of Redpoll—*Acanthis linaria*, with 3 "subspecies" *holbœlli*, *rostrata* and *rufescens*, and *A. exilipes* with a "subspecies" *hornemanni*; but the reasons for taking this view of a confessedly very difficult subject are not clearly stated, and it would seem as if the specimens enumerated by him were chiefly sorted according to the length of their wing, which he is careful to give.

The name Redshank, prefixed by some epithet as Black, Dusky, or Spotted, has also been applied to a larger but allied species—the *T. fuscus* of ornithologists. This is a much less common bird, and in Great Britain as well as the greater part of Europe it only occurs on its passage to or from its breeding-grounds, which are usually found north of the Arctic Circle, and differ much from those of its congeners—the spot chosen for the nest being nearly always in the midst of forests and, though not in the thickest part of them, often with trees on all sides, generally where a fire has cleared the undergrowth, and mostly at some distance from water. This peculiar habit was first ascertained by Wolley in Lapland in 1853 and the following year. The breeding-dress this bird assumes is also very remarkable, and seems (as is suggested) to have some correlation with the burnt and blackened surface interspersed with white stones or tufts of lichen on which its nest is made—for the head, neck, shoulders and lower parts are of a deep black, contrasting vividly with the pure white of the back and rump, while the legs become of an intense crimson. At other times of the year the plumage is very similar to that of the common Redshank, and the legs are of the same light orange-red.

REDSTART, a bird well known in Great Britain, in many parts of which it is called Firetail—a name of almost the same meaning, since "start" is from the Anglo-Saxon *steort*, a tail.[1] This beautiful bird, the *Ruticilla phœnicurus* of most ornithologists, returns to England about the middle or towards the end of April, and at once takes up its abode in gardens, orchards and about old buildings, when its curious habit of flirting at nearly every change of position its brightly-coloured tail, together with the pure white forehead, the black throat and bright bay breast of the cock, renders him conspicuous, even if attention be not drawn by his lively and pleasing though short and intermittent song. The hen is much more plainly attired; but the characteristic colouring and action of the tail pertain to her equally as to her mate. The nest is almost always placed in a hole, whether of a tree or of a more or less ruined building, and contains from five to seven eggs of a delicate greenish-blue, occasionally sprinkled with faint red spots. The young on assuming their feathers present a great resemblance to those of the REDBREAST at the same age; but the red tail, though of duller hue than in the adult, forms even at this early age an easy means of distinguishing them. The Redstart breeds regularly in all the counties of England and Wales; but, except in such localities as have been already named, it is seldom plentiful. It also reaches the extreme north of Scotland; but in Ireland it is of very rare occurrence. It appears throughout the whole of Europe in summer, and is known to winter in the interior of Africa. To the eastward its limits cannot yet be exactly defined, as several very nearly allied forms occur in Asia; and one, *R. aurorea*, represents it in Japan.

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[1] On this point the articles "Stark-naked" and "Start" in Prof. Skeat's *Etymological Dictionary* may be usefully consulted; but the connexion between these words would be still more evident had this bird's habit of quickly moving its tail been known to the learned author.

A congeneric species which has received the name of Black Redstart,[1] *R. titys*,[2] is very common throughout the greater part of the European continent, where, from its partiality for gardens in towns and villages, it is often better known than the preceding species. It yearly occurs in certain parts of England, chiefly along or near the south coast, and curiously enough during the autumn and winter, since it is in central Europe only a summer visitor, and it has by no means the high northern range of *R. phœnicurus*. The males of the Black Redstart seem to be more than one year in acquiring their full plumage (a rare thing in Passerine birds), and since they have been known to breed in the intermediate stage, this fact has led to such birds being accounted a distinct species under the name of *R. cairii*, thereby perplexing ornithologists for a long while, though now almost all authorities agree that these birds are, in one sense, immature.

More than a dozen species of the genus *Ruticilla* have been described, and the greater number of them seem to belong to the Himalayan Subregion or its confines. One very pretty and interesting form is the *R. moussieri* of Barbary, which no doubt allies the Redstart to the STONE-CHATS, *Praticola*, and of late some authors have included it in that genus. In an opposite direction the BLUETHROATS, *Cyanecula*, are apparently nearer to the Redstarts than to any other type. By the ornithologist of tolerably wide views the Redstarts and Bluethroats will be regarded as forming with the NIGHTINGALE, Redbreast, Hedge-Sparrow, Wheatear and Chats a single group of the "Family" *Sylviidæ*, which has been usually called *Saxicolinæ*, and is that which is most nearly allied to the THRUSHES.

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[1] The author of a popular work on British birds has suggested for this species the name of "Blackstart," thereby recording his ignorance of the meaning of the second syllable of the compound name as already explained, for the Black Redstart has a tail as red as that of the commoner English bird.

[2] The orthography of the specific term would seem to be *titis*, a word possibly cognate with the first syllable of TITLARK and TITMOUSE (*Ann. Nat. Hist.* ser. 4, x. p. 227).

In America the name Redstart has been not unfittingly bestowed upon a bird which has some curious outward resemblance, both in looks and manners, to that of the Old Country, though the two are in the opinion of some systematists nearly as widely separated from each other as truly Passerine birds well can be. The American Redstart is the *Setophaga ruticilla* of authors, belonging to the purely New-World Family *Mniotiltidæ*, and to a genus which contains about a dozen species, ranging from Canada (in summer) to Bolivia. The wonderful likeness, coupled of course with many sharp distinctions, upon which it would be here impossible to dwell, between the birds of these two genera of perfectly distinct origin, is a matter that must compel every evolutionist to admit that we are as yet very far from penetrating the action of Creative Power, and that especially we are wholly ignorant of the causes which in some instances produce analogy.

REDTAIL, in North America the *Buteo borealis* (BUZZARD).

REDTHROAT, the name in Australia for the *Pyrrholæmus brunneus* of Gould (*Proc. Zool. Soc.* 1840, p. 173; *B. Austral.* iii. pl. 68), a little bird, akin to *Acanthiza*, whose habits are well described by Mr. North (*Nests and Eggs of B. Austral.* pp. 145, 146).

REDWING, Swedish *Rödvinge*, Danish *Röddrossel*, German *Rothdrossel*, Dutch *Koperwiek*, a species of THRUSH, the *Turdus iliacus* of authors, which is an abundant winter visitor to the British Islands, arriving in autumn generally about the same time as the FIELDFARE does. The bird has its common English name,[1] from the sides of its body, its inner wing-coverts and axillaries being of a bright reddish-orange, of which colour, however, there is no appearance on the wing itself while the bird is at rest, and not much is ordinarily seen while it is in flight. In other respects it is very like a Song-Thrush, and indeed in France and some other countries it bears the name *Mauvis* or *Mavis*, often given to that species in some parts of Britain; but its coloration is much more vividly contrasted, and a conspicuous white, instead of a light brown, streak over the eye at once affords a ready diagnosis. The Redwing breeds in Iceland, in the subalpine and arctic districts of Norway, Sweden and Finland, and thence across Northern Russia and Siberia, becoming scarce to the eastward of the Jenisei, and not extending beyond Lake Baikal. In winter it visits the whole of Europe and North Africa, occasionally reaching Madeira, while to the eastward it is found at that season in the north-western Himalayas and Kohat. Many writers have praised the song of this bird, comparing it with that of the NIGHTINGALE; but herein they seem to have been as much mistaken as in older times was Linnæus, who, according to Nilsson (*Orn. Svecica*, i. p. 177, note), failed to distinguish in life this species from its commoner congener *T. musicus*. The notes of the Redwing are indeed pleasing in places where no better songster exists; but the present writer, who has many times heard them under very favourable circumstances, cannot but suppose that those who have called the Redwing the "Nightingale" of Norway or of Sweden have attributed to it the credit that properly belongs to the Song-Thrush; for to him it seems that the vocal utterances of the Redwing do not place it even in the second rank of feathered musicians. Its nest and eggs a good deal resemble those of the Blackbird, and have none of the especial characters which distinguish those of the Song-Thrush.

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[1] Many old writers assert that this bird used to be known in England as the "Swinepipe"; but except in books, this name does not seem to survive to the present day. There is no reason, however, to doubt that it was once in vogue, and the only question is how it may have arisen. If it has not been corrupted from the German *Weindrossel* or some other similar name, it may refer to the soft inward whistle which the bird often utters, resembling the sound of the pipe used by the swineherds of old when collecting the animals under their charge, whether in the wide stubbles or the thick beech-woods; but another form of the word (which may, however, be erroneous) is "Windpipe," and this might lead to a conclusion very different, if indeed to any conclusion at all.

In South Africa the name Redwing is applied to a very different kind of bird, one of the FRANCOLINS, *Francolinus levaillanti*, a valuable game-bird, not only for the sport it affords, but for the excellence of its flesh.

REED-BIRD, a name variously bestowed in different countries on almost any species of small bird affecting reeds. In England it is generally the Reed-WARBLER or Reed-Wren, *Acrocephalus streperus*; in North America the BOBOLINK, while the English in South Africa, in India and Australia seem to use it without much specialization. REED-BUNTING and REED-SPARROW are in England names of *Emberiza schœniclus* often called the Black-headed BUNTING; REED-THRUSH is the book-name of *A. arundinaceus* (otherwise

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"Whindle" and "Wheenerd" have also been given as two other old English names of this bird (*Harl. Miscellany*, ed. 1, ii. p. 558), and these may be referred to the local German *Weindrustle* and *Winsel*.

turdoides), while REED-PHEASANT is the local name in East Anglia for the unhappily-called Bearded TITMOUSE.

REEL-BIRD or REELER, a local name for what in books is called the Grasshopper-WARBLER, *Locustella nævia*, while the prefix "Night" signified what is usually known as Savi's WARBLER, *Potamodus luscinioides*, in the days when it inhabited the English Fen-country. In either case the name was applied from the resemblance of the bird's song to the noise of the reel used by the hand-spinners of wool.

REEVE, the hen RUFF, a word that puzzles philologists as offering an apparently inexplicable vowel-change (*cf.* Skeat, *Etymol. Dict.* s.v.).

REGENT-BIRD, a very beautiful and by no means abundant inhabitant of the eastern part of Australia, conspicuous for the deep golden-yellow and velvety-black of the male's plumage. Originally described in 1801 by Latham (*Ind. Orn. Suppl.* p. xliv.) from a specimen in Lambert's collection, as a Thrush, *Turdus melinus*, it was figured and again described in 1808 by J. W. Lewin (*B. N. Holl.* p. 10, pl. vi.) as *Meliphaga chrysocephala*, the Golden-crowned Honey-sucker; a name changed by him in the subsequent issue of his work in 1822 (*B. N. S. Wales*, p. 6) to King Honey-sucker. In 1823, Quoy and Gaimard (*Ann. Sc. Nat.* v. p. 489),[1] referred it to the Orioles as *Oriolus regens*. In 1825 Swainson (*Zool. Journ.* i. p. 476), though not removing it from the Orioles, perceived in it some affinities to the Birds-of-Paradise, and founded for it a new genus, *Sericulus*, which has since been generally accepted, while in 1845 G. R. Gray (*Gen. B.* i. p. 233), aided probably by access to the unpublished drawings of Lambert, was able to establish the identity of Lewin's species with Latham's (which must have been from a female specimen), and thus the bird became the *Sericulus melinus* of ornithology.[2] Still its affinities remained in doubt until Mr. Coxen's account in 1864 of the discovery by Mr. Waller of Brisbane that it was a BOWER-BIRD (Gould, *Handb. B. Austral.* i. pp. 458-461)—a fact confirmed shortly after by Mr. E. P. Ramsay (*Ibis*, 1867, p. 456) who had really observed it earlier. The "bower" of this bird, however, does not seem to be so elaborate as are the structures raised by its allies, but it is applied to exactly the same uses, and has nothing whatever to do with the nest, which is built in a tree. The name "Mock Regent-bird" is said to be given to one of the Australian HONEY-SUCKERS, *Meliphaga phrygia*, from its black and yellow plumage.

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[1] From their more elaborate account (*Voy. de l'Uranie et de la Physicienne, Zool.* pp. 46, 105, pl. 22) it appears that when they were in Australia in 1819 the colonists called the bird the "Prince Regent," and this indicates the origin of its present name. A few years later Lesson (*Voy. de la Coquille, Zool.* p. 641) confirmed their statement, but improved upon it by mistakes of his own which have gained currency in this country. He supposed it to have been discovered during the Regency (which only began in 1810), and declared that Lewin (the number of whose plate he misquotes) had called it "King's Honey-sucker" after a former governor of that name, whereas the change, as mentioned in the text, was doubtless due to the Regent becoming King in 1820. The earliest appearance of the name Regent-bird known to me is in the list of Australian animals included in the *Geographical Memoirs of New South Wales*, edited in 1825 by Barron Field (p. 503).

[2] Stephens (*Gen. Zool.* x. p. 240) has the name *mellinus*, and the spelling,

REGULUS, a genus founded in 1800 by Cuvier (*Leç. d'Anat. comp.* tab. ii.) for the *Motacilla regulus* of Linnæus (GOLDCREST), and often used as an English word; but it is to be noted that the *regulus* of classical or at least mediæval writers was the WREN.

REMIGES, the principal FEATHERS of the wing by which the bird is sustained and rowed forward in FLIGHT, consisting of two series—PRIMARIES or "manuals," and CUBITALS commonly called "secondaries," according as they are borne by the bones of the manus or the ulna.[1] If the method of enumeration before recommended (pp. 118, 741) be adopted, as long ago suggested by Forbes (*Proc. Zool. Soc.* 1879, p. 256, note 2), but as yet followed only by a few scientific writers, vague and often contradictory expressions are obviated. The taxonomic value of Remiges is not to be despised, being as good as that of many internal characters; but it is curious that their least important features are made most of by ordinary ornithological writers, while the really useful information they give is persistently ignored. The phylogenetic development of the Remiges furnishes an interesting problem. The late Mr. Wray (*Proc. Zool. Soc.* 1887, pp. 343-357, pls. xxix.-xxxii.) discovered that in the embryo the first traces of wing-feathers appear on the dorsal surface in successive rows, of which the last but one or last but two grows more rapidly than the rest, and in conjunction with the growing tendinous fascia at the posterior margin of the wing, the stronger series develops into the Remiges, while the weaker becomes the "reversed" TECTRICES.

The earliest Reptilian Birds[2] most likely possessed a somewhat uniform covering of feathers on their fore limbs, those of the lower surface being softer and more downy, those of the upper firmer and smoother, while the first that grew out strong and large were those on the upper hind margin of the forearm, with the effect of protecting the sides of the body and possibly of occasionally serving as a parachute, these advantages being preserved and increased by

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since adopted by G. R. Gray and Prof. Cabanis may be grammatically more correct if the word, not a common one, really signifies honey-coloured.

[1] "Tertials," spoken of by many writers, have no separate existence.

[2] "*Herpetornithes*," Gadow, *Thier-Reich*, *Vögel*, ii. p. 86.

Natural Selection, just as the scales on the hind margin of Turtles' paddles are elongated and flattened out. Subsequently their lengthening and strengthening extended to the feathers of the metacarpus and so on to the digits, which at this stage were still free (*Archæopteryx*). If these ancestral Birds possessed a *patagium* or duplication of the skin which would assist as a parachute, it was gradually restricted to the proximal region between the fore limb and the trunk, or it might interfere with the folding of the limb now become a wing. Already in the Reptiles the POLLEX had shewn a tendency to shorten, and it remained outside the series of the other fingers, taking part only to a slight extent in the formation of the wings. The metacarpals became elongated and coalesced because of their simultaneous and one-sided use. The other bones of the mid-hand and of the fifth, fourth and in part of the third digits were reduced in size and number, since the newly-gained and much-strengthened axis required their presence the less, and moreover the full development of those digits would have hindered the folding of the wing, which is effected by a strong abduction towards the ulnar side. From purely mechanical causes the primaries grew into quills stronger and larger than the cubitals. In the embryos of many Birds the Remiges of the forearm appear earlier and for some time grow more rapidly than those of the *manus*, until they are overtaken by the primaries —thus repeating their phylogenetic development.

After the reduction and partial ancylosis of the bones of the *manus* have once taken place it is as impossible to free or separate the coalesced metacarpals again as it is to restore the lost digits. Neither the soft Remiges of the Ostrich nor the vane-less quills of the Cassowaries could ever have produced their typically "Neornithic" wing-skeleton.[1]

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[1] As bearing on this important subject the following references may be of use:—E. Alix, "Sur les plumes ou rémiges des ailes des Oiseaux," *Journ. Soc. Philomath.* 1874, p. 10; J. Cabanis, "Ornithologische Notizen," *Arch. f. Naturg.* xiii. (1847), pp. 16, 256; E. Coues, "On the number of the primaries in Oscines," *Bull. Nutt. Orn. Club*, i. p. 60 (1876); H. Gadow, "Remarks on the numbers and on the phylogenetic development of the Remiges of Birds," *Proc. Zool. Soc.* 1888, p. 655; J. G. Goodchild, "Observations on the disposition of the cubital coverts in Birds," *op. cit.* 1886, p. 184; J. A. Jeffries, "On the number of primaries in Birds," *Bull. Nutt. Orn. Club*, vi. p. 156 (1881); W. P. Pycraft, "Contribution to the pterylography of Birds' Wings," *Trans. Leicester Lit. and Philos. Soc.* ii. pt. 3 (1890); C. J. Sundevall, "Om Foglarnes vingar," *K. Vet.-Ak. Handl.* 1843, p. 303 (Engl. transl. *Ibis*, 1886, p. 389); J. Vian, "De la plume bâtarde dans les Oiseaux," *Rev. Mag. Zool.* 1872, p. 83; A. R. Wallace, "On the arrangement of the Families constituting the Order Passeres," *Ibis*, 1874, p. 406; R. S. Wray, "On some points in the morphology of the wings of Birds," *Proc. Zool. Soc.* 1887, p. 343; with of course the great works of Nitzsch and Prof. Fürbringer.

REPRODUCTIVE ORGANS, or those which serve for propagation, consist of the germ-producing glands and their efferent ducts, and are best considered according to sex.

I. In the *Female*, a pair of Ovaries are developed, but with rare exceptions only that on the left side becomes functional. The mass of embryonic eggs (see page 195) of which each is composed presents the appearance of a cluster of grapes, situated at the anterior end of the KIDNEY of the same side, immediately below the posterior end of the LIVER, and is separated from its fellow by the descending AORTA, whence it receives its supply of blood, while it discharges into the posterior *vena cava*. The number of germs which form the ovary frequently amounts to several hundred, which during the breeding-season exhibit all stages of development from a mere microscopic object to a full-grown ripe ovum, with its large amount of yolk. The germs which do not ripen during the season undergo a process of resorption, and this is accompanied by the dwindling in size of the whole ovary, so that during winter the determination of the sex of any particular bird may be a doubtful

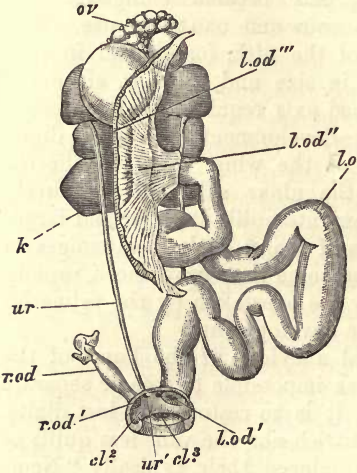

FIG. 1.

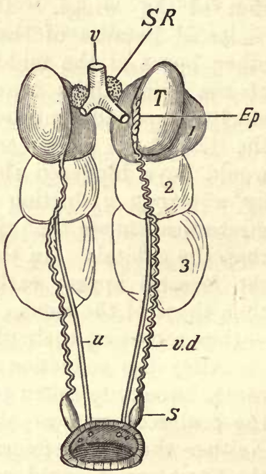

FIG. 2.

REPRODUCTIVE ORGANS OF PIGEON.

Fig. 1.—Female. *cl*^{2}, second cloacal chamber in urodæum; *cl*^{3}, inmost chamber; *k*, kidney; *l.od*, left oviduct; *l.od′*, opening of the same into the urodæum; *l.od″*, infundibulum; *l.od‴*, opening of the same into the body cavity; *ov*, ovary; *r.od*, abortive right oviduct; *ur*, ureter; *ur′*, opening of the same into the urodæum. (About 2/3 of the natural size. After T. J. Parker.)

Fig. 2.—Male. 1, 2, 3, the three principal lobes of the kidney; *Ep*, epididymis; *SR*, suprarenal bodies; *T*, testes; *u*, ureter; *v*, vena cava posterior; *v.d*, vas deferens with a swelling at *S*. (Natural size.)

if not a difficult matter.[1] The ripe eggs are received by the Oviducts, which furnish them with the "white albumen," the shell-membrane and the shell, before expelling them into the CLOACA (pp. 197, 198). In young birds both oviducts are almost equally developed, but the right one soon becomes reduced to an insignificant ligamentous strand along the ventral side of part of the Kidney. This one-sided suppression of the organs may possibly be referable to the inconvenience that might be caused were each oviduct to contain an egg ready to be deposited. Practically the Oviduct is a gut-like tube suspended by its own mesentery and opening by a wide slit-like infundibulum into the body-cavity near the Ovary. This upper portion of the Oviduct, corresponding with the Fallopian tube of human anatomy, has extremely thin walls, while peritoneal elastic lamellæ attach it to the hinder margin of the left LUNG in such a way as to secure the reception of any ripe egg that may burst from the Ovary. The next portion of the Oviduct is much narrower with thick glandular walls, which, twisting and turning irregularly, secrete the albumen, and it is connected by a constricted portion, the isthmus (p. 197), with a dilated "uterus," situated on the ventral and partly on the right side of the RECTUM and cloaca. The walls of the isthmus deposit the shell-membrane, while those of the uterus secrete the calcareous shell and the pigment, and the uterus leads into a rather glandless portion, the "vagina" (which in a common Fowl is about an inch, and in a Goose two inches in length) opening into the dorsal wall of the urodæum (p. 90) to the left of the urethral papilla.

Microscopically examined, the structure of the parts above mentioned is seen to be as follows—The whole duct consists of four layers: (1) an outer peritoneal, mesenteric lamella; (2) a layer of smooth unstriped muscular and, for the most part, longitudinal fibres, most numerous in the uterus and the vagina, but scanty or absent in the infundibulum; (3) connective tissue with blood-vessels; and (4) the *tunica mucosa*, mucous membrane, which in the infundibulum is thin and contains numerous cells with cilia, the vibrating motion of which propels the ovum downward. In the other portions of the duct the mucous membrane forms from ten to twenty or even more folds, and contains numerous secreting glands.

During the breeding-season the whole Oviduct is in a state of hypertrophic turgescence. In the common Fowl at the period of rest it will be only some six or seven inches long and scarcely a line wide, but at the time of laying eggs it becomes more than two feet in length and nearly half an inch in width, thus increasing its volume about fifty times; and this remarkable change takes place annually.

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[1] This is so often the case that the usual notes on the labels which collectors attach to their specimens are at that season mostly the expression of fancy. The vicinity of the suprarenal capsules, which are of a pale yellow colour and "granular" in appearance, makes them liable to be mistaken for ovaries, or more often for the testes when in a dormant and much reduced condition.

II. In the *Male*, the Testes are a pair of whitish-yellow glands, of oval or globular shape—occasionally (as in *Cypselus*) vermiform—and lie at the anterior end of the KIDNEYS, being kept in position by an enveloping peritoneal lamella, whence septa extend into the interior. Within the meshwork thus formed are embedded the spermatic vesicles or *tubuli seminiferi*, which combine toward the median side of each testis into wider tubes that in their turn leave it, and joining numerous convoluted canals, the whole constitute the Epididymis, which is irregular in shape and as a rule of a deeper colour. Generally the left testis is bigger than the right, although both are equally functional. During the breeding-season they are greatly enlarged, as has been most often remarked in the case of the House-Sparrow, where they increase from the size of a mustard-seed to that of a small cherry, temporarily displacing the usual arrangement of intestine, liver and stomach. The canals of each epididymis unite to form a narrow tube, the *vas deferens*, that, with small undulations, passes laterally along the ureter of the same side, over the ventral surface of the kidney, and opens upon a small papilla into the urodæum of the CLOACA (p. 90). The walls of the *vasa deferentia* are furnished with unstriped muscular fibre, but are devoid of glands, and there are no accessory glands, seminal or prostate. In many birds, especially the *Passeres*, the vasa deferentia increase considerably in length during the breeding-season, and form a closely convoluted mass which often causes a protrusion of the cloacal walls, a peculiarity that is particularly remarkable in some of the *Ploceidæ*,[1] and has been observed in *Accentor collaris*.

The spermatozoa of Birds, though extremely minute, have a complicated structure, the different parts of which present so many differences of shape, size and proportion in various groups, that they may possibly afford characters of no mean taxonomic value (*cf.* Ballowitz, *Anat. Anzeiger*, 1886, pp. 363-376, and *Arch. mikrosk. Anat.* xxxii. pp. 402-473, tabb. 14-18).

RETINA, the visual or perceptive screen formed by the terminal expansion of the optic nerve and lining the inner chamber of the EYE.

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[1] The external protrusion thus caused in certain of the South-African Weaver-birds is often visible in their prepared skins, for it dries into a hard hook-shaped excrescence and has given rise to various absurd and speculative explanations.

RHEA, the name given in 1752 by Möhring[1] to a South-American bird which, though long before known and described by the earlier writers—Nieremberg, Marcgrave and Piso (the last of whom has a recognizable but rude figure of it)—had been without any distinctive scientific appellation. Adopted a few years later by Brisson, the name has since passed into general use, especially among English authors, for what their predecessors had called the American Ostrich; but on the European continent the bird is commonly called *Nandu*,[2] a word corrupted from a name it is said to have borne among the aboriginal inhabitants of Brazil, where the Portuguese settlers called it *Ema* (*cf.* EMEU). The resemblance of the Rhea to the OSTRICH was at once perceived, but the differences between them were scarcely less soon noticed, for some of them are very evident. The former, for instance, has three instead of two toes on each foot, it has no apparent tail, nor the showy wing-plumes of the latter, and its head and neck are clothed with feathers, while internal distinctions of still deeper significance have since been dwelt upon by Prof. Huxley (*Proc. Zool. Soc.* 1867, pp. 420-422) and the late Mr. W. A. Forbes (*op. cit.* 1881, pp. 784-787); thus justifying the separation of these two forms more widely even than as Families; and there can be little doubt that they should be regarded as types of as many Orders—*Struthiones* and *Rheæ*—of the Subclass RATITÆ.[3] Structural characters no less important separate the Rheas from the Emeus, and, apart from their very different physiognomy, the former can be readily recognized by the rounded form of their contour-feathers, which want the AFTERSHAFT that in the Emeus and CASSOWARIES is so long as to equal the main shaft, and contributes to give these latter groups the appearance of being covered with shaggy hair. Though the Rhea is not decked with the graceful plumes which adorn the Ostrich, its feathers have yet a considerable market-value, and for the purpose of trade in them it is annually killed by thousands, so that it has been already extirpated from much of the country it formerly inhabited,[4] and its total extinction as a wild animal is probably only a question of time. Its breeding-habits are precisely those which have been already described in the case of other Ratite birds. Like most of them it is polygamous, and the male performs the duty of incubation, brooding more than a score of eggs, the produce of several females—facts known to Nieremberg more than two hundred and fifty years since, but hardly accepted by naturalists until recently.

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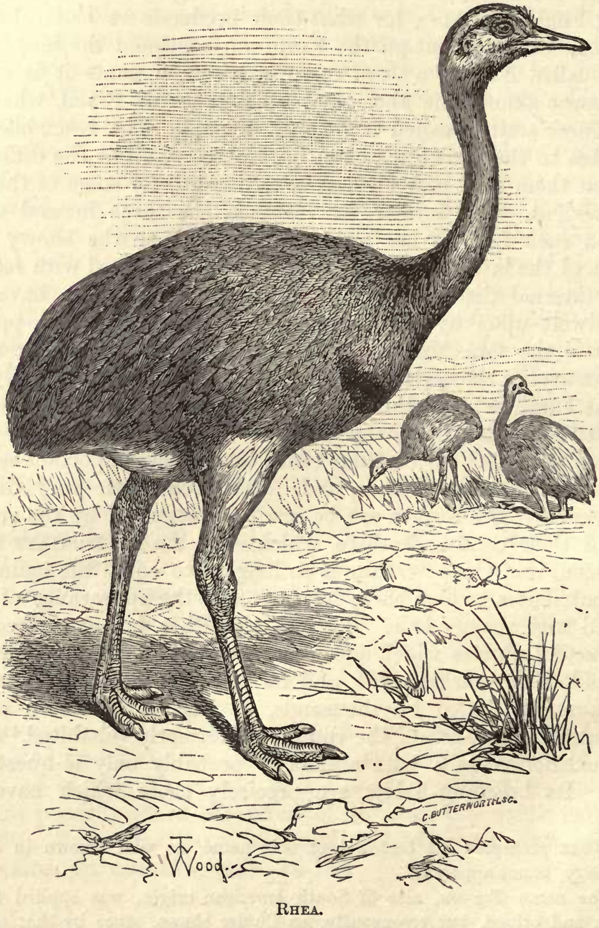
[1] What prompted his bestowal of this name, so well known in classical mythology, is not apparent.

[2] The name *Touyou*, also of South-American origin, was applied to it by Brisson and others, but erroneously, as Cuvier shews, since by that name, or something like it, the JABIRU is properly meant.

[3] *Ann. Nat. Hist.* ser. 4, xx. p. 500.

[4] Mr. Harting, in his and Mr. De Mosenthal's *Ostriches and Ostrich Farming*, from which the woodcut here introduced is by permission copied, gives (pp. 67-72) some portentous statistics of the destruction of Rheas for the sake of their feathers, which, he says, are known in the trade as "Vautour" to distinguish them from those of the African bird.



Rhea.

From causes which, if explicable, do not here concern us, no examples of this bird seem to have been brought to Europe before the beginning of the present century, and accordingly the descriptions previously given of it by systematic writers were taken at second hand, and were mostly defective if not misleading. In 1803 Latham issued a wretched figure of the species from a half-grown specimen in the Leverian Museum, and twenty years later said he had seen only one other, and that still younger, in Bullock's collection (*Gen. Hist. B.* viii. p. 379).[1] A bird living in confinement at Strasburg in 1806 was, however, described and figured by Hammer in 1808 (*Ann. du Muséum*, xii. pp. 427-433, pl. 39), and, though he does not expressly say so, we may infer from his account that it had been a captive for some years. In England the *Report* of the Zoological Society for 1833 announced the Rhea as having been exhibited for the first time in its gardens during the preceding twelvemonth. Since then many other living examples have been introduced, and it has bred both there and elsewhere in Britain, but the young do not seem to be very easily reared.[2]

Though considerably smaller than the Ostrich, and, as before stated, wanting its fine plumes, the Rhea in general aspect far more resembles that bird than the other *Ratitæ.* The feathers of the head and neck, except on the crown and nape, where they are dark brown, are dingy white, and those of the body ash-coloured tinged with brown, while on the breast they are brownish-black, and on the belly and thighs white. In the course of the memorable voyage of the 'Beagle,' Darwin came to hear of another kind of Rhea, called by his informants *Avestruz petise*, and at Port Desire on the east coast of Patagonia he obtained an example of it, the imperfect skin of which enabled Gould to describe it (*Proc. Zool. Soc.* 1837, p. 35) as a second species of the genus, naming it after its discoverer. *Rhea darwini* differs in several well-marked characters from the earlier known *R. americana.* Its bill is shorter than its head; its tarsi are reticulated instead of scutellated in front, with the upper part feathered instead of being bare; and the plumage of its body and wings is very different, each feather being tipped with a distinct whitish band, while that of the head and neck is greyish-brown. A further distinction is also asserted to be shewn by the eggs—those of *R. americana* being of a yellowish-white, while those of *R. darwini* have a bluish tinge. Some years afterwards Mr. Sclater described (*op. cit.* 1860, p. 207) a third and smaller species, more closely resembling the *R. americana*, but having apparently a longer bill, whence he named it *R. macrorhyncha*, more slender tarsi and shorter toes, while its general colour is very much darker, the body and wings being of a brownish-grey mixed with black. The precise geographical range of these three species is still undetermined. While *R. americana* is known to extend from Paraguay and southern Brazil through the state of La Plata to an uncertain distance in Patagonia, *R. darwini* seems to be the proper inhabitant of the country last named, though M. Claraz asserts (*op. cit.* 1885, p. 324) that it is occasionally found to the northward of the Rio Negro, which had formerly been regarded as its limit, and, moreover, that flocks of the two species commingled may be very frequently seen in the district between that river and the Rio Colorado. On the "pampas" *R. americana* is said to associate with herds of deer (*Cariacus campestris*), and *R. darwini* to be the constant companion of guanacos (*Lama huanacus*)—just as in Africa the Ostrich seeks the society of zebras and antelopes. As for *R. macrorhyncha*, it was found by Forbes (*Ibis*, 1881, pp. 360, 361) to inhabit the dry and open "sertoẽs" of north-eastern Brazil, a discovery the more interesting since it was in that part of the country that Marcgrave and Piso became acquainted with a bird of this kind, though the existence of any species of Rhea in the district had been long overlooked by or unknown to succeeding travellers.[1]

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[1] The ninth edition of the *Companion* to this collection (1810, p. 121) states that the specimen "was brought alive" [? to England].

[2] Interesting accounts of the breeding of this bird in confinement are given, with much other valuable matter, by Mr. Harting in the work already cited.

RHINOCEROS-BIRD, an old book-name for one or more of the HORNBILLS (p. 433), and occasionally used by modern South-African travellers for the OX-PECKER (p. 680).

RIBS, if typically developed, have a double attachment to the vertebræ—a *capitulum* or "head" articulating with the centrum of a vertebra, and a *tuberculum* or knob movably applied to the transverse process of the same vertebra. The portion next to the "head" is known as the "neck," and to it succeeds the shaft, composed of two pieces, the dorsal or vertebral (to the posterior margin of which is generally attached an UNCINATE PROCESS) and the ventral, which is sometimes called the sternal or sterno-costal rib. If this ventral piece reaches and articulates with the sternum, the whole is called a "true" Rib; but if the sternum is not reached, the whole is called a "false" Rib, even if the ventral piece be present.

According to their position Ribs are usually distinguished as (1) *Cervical* Ribs possessing only a short shaft, while both head and tubercle are immovably fused with the vertebra; (2) *Cervico-dorsal* Ribs movably attached to the vertebræ, being in number from 1 to 4 on each side, with a shortened shaft which may in some cases carry a small ventral piece; (3) *Thoracic* Ribs, connecting the vertebral column with the sternum, from 3 to 9 in number—as

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[1] Beside the works above named and those of other recognized authorities on the ornithology of South America such as Azara, Prince Max of Wied, Prof. Burmeister and others, more or less valuable information on the subject is to be found in Darwin's *Voyage*; Dr. Böcking's "Monographie des Nandu" in (Wiegmann's) *Archiv für Naturgeschichte* (1863, i. pp. 213-241); Prof. R. O. Cunningham's *Natural History of the Strait of Magellan* and paper in the Zoological Society's *Proceedings* for 1871 (pp. 105-110), as well as Dr. Gadow's still more important anatomical contributions in the same journal for 1885 (pp. 308 *et seqq.*)

3 or 4 in *Columbidæ*, 4 or 5 in *Passeres* and most *Picariæ*, 4 to 7 in *Steganopodes* and 4 to 9 in *Anseres*; (4) *Lumbar* Ribs, following the Thoracic, and often consisting only of a short dorsal piece which is thus frequently fused with the overlapping part of the ILIUM. The number of Ribs varies (not so much as a whole, but according to the regions to which they belong) among closely-allied species as well as among individuals of the same species. Usually an increased number of cervical or lumbar "false" Ribs means a reduced number of "true" or thoracic Ribs, and *vice versâ*. Speaking generally, a greater number of Ribs, and especially of thoracic Ribs, indicates a lower and therefore phylogenetically older condition, a feature which is found in the Bird not only in its embryonic but even during its adolescent stage. From a taxonomic point of view Ribs are valueless.

RICE-BIRD, one of the many names of the BOBOLINK (p. 46), and perhaps locally applied in the East Indies to others not at all allied (*cf.* PADDY-BIRD, p. 683).

RICHEL-BIRD (etymology[1] and spelling doubtful) said to be a local name of the Lesser TERN.

RIFLEMAN-BIRD, or RIFLE-BIRD, names given by the English in Australia to a very beautiful inhabitant of that country,[2] probably because in coloration it resembled the well-known uniform of the rifle-regiments of the British army, while in its long and projecting hypochondriac plumes and short tail a further likeness might be traced to the hanging pelisse and the jacket formerly worn by the members of those corps. Be that as it may, the cock bird is clothed in velvety-black generally glossed with rich purple, but having each feather of the abdomen broadly tipped with a chevron of green bronze, while the crown of the head is covered with scale-like feathers of glittering green, and on the throat gleams a triangular patch of brilliant bluish emerald, a colour that reappears on the whole upper surface of the middle pair of tail-quills. The hen is greyish-brown above, the crown striated with dull white; the chin, throat and a streak behind the eye are pale ochreous, and the lower parts deep buff, each feather bearing a black chevron. According to James Wilson (*Ill. Zool.* pl. xi.), specimens of both sexes were obtained by Sir T. Brisbane at Port Macquarie, whence, in August 1823, they were sent to the Edinburgh Museum, where they arrived the following year; but the species was first described by Swainson in January 1825 (*Zool. Journ.* i. p. 481) as the type of a new genus *Ptiloris*, more properly written *Ptilorrhis*,[1] and it is generally known in ornithology as *P. paradisea.* It inhabits the northern part of New South Wales and southern part of Queensland as far as Wide Bay, beyond which its place is taken by a kindred species, the *P. victoriæ* of Gould, which was found by John Macgillivray on the shores and islets of Rockingham Bay. Further to the north, in York Peninsula, occurs what is considered a third species, *P. alberti*, very closely allied to and by some authorities thought to be identical with the *P. magnifica* (Vieillot) of New Guinea—the "PROMEROPS" of many writers. From that country a fifth species, *P. wilsoni*, has also been described by Mr. Ogden (*Proc. Acad. Philad.* 1875, p. 451, pl. 25). Little is known of the habits of any of them, but the Rifleman-bird proper is said to get its food by thrusting its somewhat long bill under the loose bark on the boles or boughs of trees, along the latter of which it runs swiftly, or by searching for it on the ground beneath. During the pairing-season the males mount to the higher branches and there display and trim their brilliant plumage in the morning sun, or fly from tree to tree uttering a note which is syllabled "yass" greatly prolonged, but at the same time making, apparently with their wings, an extraordinary noise like that caused by the shaking of a piece of stiff silk stuff. In February 1887 Mr. A. J. Campbell of Melbourne described (*Vict. Nat.* ii. p. 165) the egg of the Queensland species, *P. victoriæ*, which he had lately received from Rockingham Bay, being apparently the first authentic account of the nidification of any species of the genus ever given. The nest is said to have been an open one, placed in dense scrub, and containing two eggs of a light flesh-colour with subdued spots and small blotches of dull red or brown. The genus *Ptilorrhis* is now generally considered to belong to the *Paradiseidæ*, or BIRDS-OF-PARADISE, and in his *Monograph* of that Family all the species then known are beautifully figured by Mr. Elliot, as will doubtless be the case also in the similar work by Dr. Sharpe now in course of publication.

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[1] "Rekels" (*Cathol. Angl.* p. 302), "Richelle" or "Rychelle" (*Prompt. Parvul.* pp. 66, 433), derived from reke or reek (smoke), is an old word for incense, but no connexion with the bird's name is apparent.

[2] Its English name seems to be first printed in 1825 by Barron Field (*Geog. Mem. N. S. Wales*, p. 503). In 1828 Lesson and Garnot said (*Voy. de la Coquille, Zool.* p. 669) that it was applied "pour rappeler que ce fut un soldat de la garnison [of New South Wales] qui le tua le premier,"—which seems to be an insufficient reason, though the statement as to the bird's first murderer may be true. The Rifleman of New Zealand is *Acarthidositta chloris.*

RING-DOVE, properly *Columba palumbus*, see DOVE (p. 162); but a name often misapplied to the Collared or Barbary Dove (p. 165).

RING-OUSEL, *Turdus torquatus*, see OUSEL (p. 667).

RING-PLOVER, *Ægialitis hiaticola*, see PLOVER (p. 482). This bird Sir Thomas Browne called "Ringlestones," the derivation of which word is open to conjecture; but Prof. Skeat thinks it may refer to the bird's habit of "ranging" (an old form of arranging) the stones for its nest.

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[1] Some writers have amended Swainson's faulty name in the form *Ptilornis*, but that is a mistake.

RINGTAIL, the old name for the female HARRIER (p. 410), long thought to be specifically distinct from the male; but also occasionally applied to the immature Golden EAGLE (p. 177).

RIPPOCK or RITTOCK (Icelandic *Ritur*), a local name for a TERN.

ROAD-RUNNER, a name for the CHAPARRAL-COCK (p. 84).

ROBIN, a well-known nickname of the REDBREAST, which in common use has almost supplanted the stock on which it was grafted, while it has been transplanted as well to the oldest as to the newest settlements of England beyond sea, as to Jamaica in the case of the Green TODY, to North America where the Robin pure and simple is *Turdus migratorius* (p. 250), but with the prefix Blue signifies some member of the genus *Sialia* (BLUEBIRD), in consequence only of their red breast, while in Australia the name is applied, irrespective of that character, to several species of *Petrœca*, *Melanodryas* and others (WHEATEAR), and in New Zealand to some of the birds of the probably kindred genera *Miro* and *Myiomoira*, which have no red at all about them. Robin-Snipe in North America is the KNOT in summer-plumage, when it is in winter-dress the prefix White is added.

ROC, RUC and RUKH, transliterations of the name of the colossal bird celebrated in the Arabian Nights, which as everybody knows could carry off elephants in its clutch; and according to the best authorities frequented Madagascar and its neighbourhood! Discoveries of the last half-century, or thereabouts, have shewn that what so long passed for an idle tale was possibly founded on fact, however gross have been the exaggerations. In November 1849 Strickland, who had already cited (*The Dodo &c.* p. 60) the testimony of Flacourt in 1658 (*Histoire de la grande isle Madagascar*, p. 165) as to a large bird, called "*Vouron patra*," a kind of Ostrich said to frequent the south of that island, published in 1849 (*Ann. Nat. Hist.* ser. 2, iv. p. 338) information received through Mr. Joliffe, an English naval officer, from a French trader named Dumarele, that he had seen in Madagascar the shell of an enormous egg capable of holding 13 wine-quarts, and used as a vessel for liquor by the natives (Sakalaves), who declared that such eggs were but rarely found and the bird which laid them still more rarely seen. Strickland remarked on the coincidence of this gigantic egg being in the locality to which the great traveller Marco Polo had referred the Roc. In January 1851 Isidore Geoffroy-

St. Hilaire exhibited to the French Academy of Sciences (*Comptes Rendus*, xxxii. pp. 101-107; Eng. transl. *Ann. Nat. Hist.* ser. 2, vii. p. 161) some fossils—two eggs and a few fragments of bone, which had just been brought to Paris from Madagascar by Capt. Abadie,—referring them to a bird which he named *Æpyornis maximus* and declared to be a "Rudipenne"—or allied to the Ostrich. He soon after republished (*Ann. Sc. Nat. Zool.* ser. 3, xiv. pp. 205-216) his original remarks, together with some additional information of considerable interest to the effect that, in 1832, Sganzin, who resided for some years in Madagascar, sent thence to Jules Verreaux, then at Capetown, a full-sized drawing of a gigantic egg, but this was lost at sea with all his collections; while in 1834, Goudot, another traveller in that island, obtained some fragments of egg-shells which Gervais had mentioned in 1841 (*Dict. Sc. Nat. Suppl.* i. p. 524) as resembling Ostriches'. In 1861, Prof. Bianconi (*Mem. Accad. Bologna*, xii. pp. 61-76) seriously took up the question of the identity of the Roc, described by some one to Marco Polo (for the great Venetian himself did not see it); of the "Chrocko" (which is only another form of the same word) mentioned on the map of Fra Mauro (1450) whose egg was as big as a butt; and of the *Æpyornis* of ornithology, declaring the latter to be no Struthious bird but a Vulture—an opinion which he steadily maintained throughout a long series of papers. The matter has therefore attracted some scientific attention, especially as other remains have come to light; but none can doubt after the masterly treatise of MM. Alphonse Milne-Edwards and Grandidier (*Ann. Sc. Nat.* ser. 5, xii. pp. 167-196, pls. 6-16) that the original determination was right; and therefore, according to the views taken in the present work, a group or Order *Æpyornithes* should be recognized as of equal rank with the *Struthiones* and others that form the Subclass RATITÆ. A considerable number of eggs, which from their enormous size—being the largest eggs known—are conspicuous objects, and no small number of fossil bones have now been discovered, and have been attributed to five species of which *Æ. maximus*, *medius* and *modestus* are indicated by the eminent naturalists last named, who think it possible that one of the smaller species may have survived long enough for a tradition of its existence to be transmitted, especially since some of the bones found shew marks of a cutting instrument, evidently the work of a human hand and presumably made on the recently-killed bird.[1] Sir Henry Yule (*Book of Ser Marco Polo*, ii. pp. 346-354) treated the question in his usual happy style and, acting on the hint first given by Strickland, suggested that the story of the Ruc, though it may have originated much further to the eastward, became localized in Madagascar through some rumour of *Æpyornis* and its stupendous eggs, one of which (now in the British Museum, and measuring more than 13 inches by 9·5) he figured of the natural size;[1] but there seems no doubt that the largest species of *Æpyornis* as yet found by no means equalled in bulk or height the larger forms of *Dinornithes*. Herr R. Burckhardt (*Palæontol. Abhandl.* vi. Heft 2, 1893) has referred some remains obtained by the late Dr. Hildebrandt to a fifth species *Æ. hildebrandti*.

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[1] They cite from a French work of fiction published in 1696 under the title of *Furteriana* a passage describing enormous birds inhabiting Madagascar and there carrying off sheep and human beings, so that the latter had to walk about with tame tigers for their own protection! This modern embellishment of the old Arabian stories is hardly an improvement if probability is to be regarded.

ROCKIER, the name of a Pigeon, presumably *Columba livia*, commonly called the Rock-Dove; but (*teste* Gilb. White, *N. H. Selborne*, Lett. xliv. to Pennant) applied to the Stock-Dove, *C. œnas*, so long confounded with it (p. 163).

RODE-GOOSE (Germ. *Rotgans*), a local name given by fowlers to the Brant-Goose (pp. 57, 375).

ROERDOMP, the Dutch name of the Bittern (p. 40), commonly used by colonists in South Africa.

ROLLER, a very beautiful bird, so called from its way of occasionally rolling or turning over in its flight,[2] somewhat after the fashion of a Tumbler-Pigeon. It is the *Coracias garrulus* of ornithology, and is widely though not very numerously spread over Europe and Western Asia in summer, breeding so far to the northward as the middle of Sweden, but retiring to winter in Africa. It occurs almost every year in some part or other of the British Islands, from Cornwall to the Shetlands, while it has visited Ireland several times and is even recorded from St. Kilda. But it is only as a wanderer that it comes hither, since there is no evidence of its having ever attempted to breed in Great Britain; and indeed its conspicuous appearance—for it is nearly as big as a Daw, and very brightly coloured—would forbid its being ever allowed to escape the gun of the always-ready murderers of stray birds. Except the back, scapulars and inner cubitals, which are bright reddish-brown, the plumage of both sexes is almost entirely blue—of various shades, from pale turquoise to dark ultramarine—tinted in parts with green. The bird seems to be purely insectivorous. The genus *Coracias*, for a long while placed by systematists among the Crows, has really no affinity whatever to them, and is now properly considered to belong to the PICARIÆ, in which it forms the type of the Family *Coraciidæ*; and its alliance to the *Meropidæ* (BEE-EATER) and *Alcedinidæ* (KINGFISHER) is very evident. Some eleven other species of the genus have been recognized, one of which, *C. leucocephalus* or *abyssinus*, is said to have occurred in Scotland. India has two species, *C. indicus* and *C. affinis*, of which thousands upon thousands are annually destroyed to supply the demand for gaudy feathers to bedizen ladies' dresses. One species, *C. temmincki*, seems to be peculiar to Celebes and the neighbouring islands, but otherwise the rest are natives of the Ethiopian or Indian Regions. Allied to *Coracias* is the genus *Eurystomus* with some eight species, of similar distribution, but one of them, *E. pacificus*, has a wider extent, for it ranges from Celebes through New Guinea to Tasmania and strays to New Zealand. Madagascar has five or six very remarkable forms, belonging to the genera *Brachypteracias*, *Geobiastes* and *Atelornis*, which are considered to belong to the Family; and, according to Prof. A. Milne-Edwards, no doubt should exist on that point. Yet if doubt may be entertained it is in regard to *Leptosomus discolor*, with the cognate *L. gracilis* of the Comoros, which on account of its zygodactylous feet some authorities place among the *Cuculidæ*, while others have considered it the type of a distinct Family *Leptosomatidæ*. *Brachypteracias* and *Atelornis* present fewer structural differences from the Rollers, and perhaps may be rightly placed with them; but the species of the latter have long tarsi, and are believed to be of terrestrial habit, which Rollers generally certainly are not. These very curious and in some respects very interesting forms, which are peculiar to Madagascar, are admirably described and illustrated by a series of twenty plates in the great work of MM. Grandidier and A. Milne-Edwards on that island (*Oiseaux*, pp. 223-250), while the Family *Coraciidæ* is the subject of a monograph, published in 1893, by Mr. Dresser, as a companion volume to that on the *Meropidæ*.

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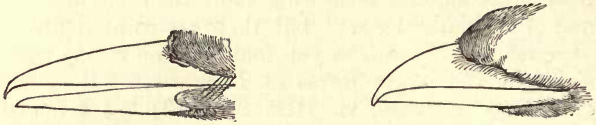
[1] One possessed by the late Mr. Rowley was said to measure 12·25 by 9·75 inches. He referred it to a distinct species which he named *Æ. grandidieri*. Dr. von Nathusius has described (*Zeitschr. wissensch. Zool.* 1871, pp. 330-334, pl. xxv.) the microscopical examination of the egg-shell in *Æpyornis*.

[2] Gesner in 1555 said that the bird was thus called, and for this reason, near Strasburg, but the name seems not to be generally used in Germany, where the bird is commonly called *Rake*, apparently from its harsh note. The French have kept the name *Rollier*. It is a curious fact that the Roller, notwithstanding its occurrence in the Levant and conspicuous appearance, cannot be identified with any species mentioned by Aristotle.



CORACIAS. EURYSTOMUS.

(After Swainson.)

ROODEBEC (Red beak), the colonial name of a bird in South Africa, *Estrilda astrild*, belonging to the WEAVER-BIRDS and akin to the AMIDAVAD (p. 11), while *Vidua principalis* (WIDOW-BIRD) is the "Koning Roodebec" or King of the same (*cf.* Layard, *B. S. Afr.* pp. 192, 188).

ROOK (Anglo-Saxon *Hróc*, Icelandic *Hrókr*,[1] Swedish *Råka*, Dutch *Roek*, Gaelic *Rocas*), the *Corvus frugilegus* of ornithology, and throughout a great part of Europe the commonest and best-known of the CROW-tribe. Beside its pre-eminently gregarious habits, which did not escape the notice of Virgil (*Georg.* i. 382)[2] and are so unlike those of nearly every other member of the *Corvidæ*,[3] the Rook is at once distinguishable from the rest by commonly losing at an early age the feathers from its face, leaving a bare, scabrous and greyish-white skin that is sufficiently visible at some distance. In the comparatively rare cases in which these feathers persist, the Rook may be readily known from the black form of Crow by the rich purple gloss of its black plumage, especially on the head and neck, the feathers of which are soft and not pointed. In a general way the appearance and manners of the Rook are so well known, to most inhabitants of the British Islands especially, that it is needless here to dwell upon them, and particularly its habit of forming communities in the breeding-season, which it possesses in a measure beyond that of any other land-bird of the northern hemisphere. Yet each of these communities, or rookeries, seems to have some custom intrinsically its own, the details of which want of space forbids any attempt to set before the reader. In a general way the least-known part of the Rook's mode of life are facts relating to its migration and geographical distribution. Though the great majority of Rooks in Britain are sedentary, or only change their abode to a very limited extent, it is now certain that a very considerable number visit this country in or towards autumn, not necessarily to abide here, but merely to pass onward, like most other kinds of birds, to winter further southward; and, at the same season or even a little earlier, it cannot be doubted that a large proportion of the young of the year emigrate in the same direction. As a species the Rook on the European continent only resides during the whole year throughout the middle tract of its ordinary range. More to the northward, as in Sweden and northern Russia, it is a regular summer-immigrant, while further to the southward, as in southern France, Spain and most parts of Italy, it is, on the contrary, a regular winter-immigrant. The same is found to be the case in Asia, where it extends eastward as far as the upper Irtish and the Ob. It breeds throughout Turkestan, in the cold weather visiting Affghanistan, Cashmere and the Punjab, and Sir Oliver St. John found a rookery of considerable size at Casbin in Persia. In Palestine and in Lower Egypt it is only a winter-visitant, and Canon Tristram noticed that it congregates in great numbers about the mosque of Omar in Jerusalem.[1]

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[1] The bird, however, does not inhabit Iceland, and the language to which the word (from which is said to come the French *Freux*) belongs would perhaps be more correctly termed Old Teutonic. There are many local German names of the same origin, such as *Rooke*, *Rouch*, *Ruch* and others, but the bird is generally known in Germany as the *Saat-Krähe*, *i.e.* Seed- (=Corn-) Crow. In Pomerania it was formerly *Korrock* (A. von Homeyer, *Zeitschr. für Orn.* xiv. p. 136).

[2] This is the more noteworthy as the district in which he was born and educated is almost the only part of Italy in which the Rook breeds. Shelley also very truly mentions the "legioned Rooks," to which he stood listening "mid the mountains Euganean," in his Lines written among those hills.

[3] The winter-gatherings of one of the American species, though sufficiently remarkable, seem to be in no way comparable to those of the Rook.

There are several moot points in the natural history of the Rook which it is impossible here to do more than mention. One is the cause of the curious shedding on reaching maturity of the feathers of its face, and another the burning question whether Rooks are on the whole beneficial or detrimental to agriculture. In England the former opinion seems to be generally entertained, but in Scotland the latter has long been popular. The absence of sufficient observations made by persons at once competent and without bias compels the naturalist to withhold his judgment on the matter, but the absence of such observations is eminently discreditable to the numerous Agricultural Societies of the United Kingdom.

ROSEHILL (often corrupted by dealers into ROSELLE), an Australian PARAKEET, *Platycercus eximius*, so called from the place of that name in New South Wales where, if it was not (as is possible) first obtained, it was formerly abundant. The nearly allied *P. icterotis* of Western Australia also frequently bears the same name.

ROTCHE (German or Dutch *Rotges*[2]—ostensibly from its cry, "rot-tet-tet"), a bird familiar to all Arctic navigators, the Little AUK of books, and *Mergulus alle* of ornithology. It is, or used to be, abundant almost beyond belief at many of its breeding-haunts, and in 1818 Beechey (*Voy. Dorothea and Trent*, p. 46) estimated that he frequently saw a column in Magdalena Bay which he calculated to consist of "nearly four millions of birds on the wing at one time.[1] These numbers may have dwindled at the present day through the depredations of sealing and whaling crews; but some of the most recent voyagers yet speak of countless congregations, though it must be remembered that, as with the *Alcidæ* in general, the breeding-places are comparatively few in regard to the extent of coast, and especially so in the case of the Rotche, which lays its bluish-white and generally spotless egg not on a ledge of rock, but in a cavity worn by the weather, or in the "scree" of loose stones at the foot of high cliffs. Consequently suitable stations are by no means common, but often many miles apart, and are, moreover, not unfrequently situated at some distance from the sea, security against foxes being apparently one great object sought in their selection. In Smith Sound the Rotche is said not to breed below lat. 68° or above 79°, and not even to occur in the so-called Polar Basin; but it goes much further northward in the Spitsbergen seas and is included among the birds of Franz-Josef Land, as presumably nesting there. Though it frequents the shores of Nova Zembla (*Proc. Zool. Soc.* 1877, p. 29), it is not found east of the Kara Sea, and thus its breeding-range is not so very wide, while the most southern locality at which its eggs have been taken is Grimsey on the north coast of Iceland, an island which is just cut by the Arctic Circle. In winter stray examples are not at all unfrequently met with on the shores of the British Islands, or are driven by stress of weather far inland, and they have occurred even in the Azores and Canaries (Godman, *Ibis*, 1866, p. 102; 1874, p. 224), but these are mere accidental wanderers from the vast hosts that must somewhere exist, and what becomes of the enormous number of birds of this and other kindred species at that season is a problem as yet unsolved, though it is obvious that they must resort to some part of the North Atlantic when the waters near their homes are frozen.

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[1] It is right to mention that the Canon considers the Rook of Palestine entitled to specific distinction as *Corvus agricola* (*Proc. Zool. Soc.* 1864, p. 444; *Ibis*, 1866, pp. 68, 69). In like manner the Rook of China has been described as forming a distinct species, under the name of *C. pastinator* (*Proc. Zool. Soc.* 1845, p. 1), from having the feathers of its face only partially deciduous.

[2] Thus spelt the name is given by Friderich Martens (*Spitsbergische oder Groenlandische Reise Beschreibung.* Hamburg: 1675, p. 61) who voyaged to Spitsbergen in a Friesland ship in 1671, and is, like the others used by him, confessedly (p. 55) of Dutch origin, though possibly in a German form. Yet the word seems not to be recognized as Dutch by authorities on that language. An English translation of Martens's narrative appeared in London in 1694 in an anonymous volume bearing the title of *An Account of several Late Voyages and Discoveries to the South and North*, dedicated to Samuel Pepys, Secretary of the Admiralty and author of the well-known *Diary*, by whom its publication was probably instigated.

The Little Auk is a compactly-built bird, some 8 inches in length, with the general coloration of its Family, glossy black above and pure white beneath, the latter in winter-plumage extending to the chin. The squab young, with their dark blue skin thinly clothed with black down, are strange-looking objects.

RUDDER-BIRD or -DUCK, a name for *Erismatura rubida*, one of the Spiny-tailed DUCKS (p. 168).

RUDDOCK, A.S. *Rudduc*, a well-known name for the REDBREAST.

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[1] This result may seem incredible; but from my own experience (*Ibis*, 1865, p. 204) I do not feel justified in doubting it (*cf. suprà*, PUFFIN, p. 751, note 2).

RUFF, so called from the very beautiful and remarkable frill of elongated feathers that, just before the breeding-season, grow thickly round the neck of the male,[1] who is considerably larger than the female, known as the REEVE. In many respects this species, the *Tringa pugnax* of Linnæus and the *Machetes pugnax* of the majority of modern ornithologists, is one of the most singular in existence, and yet its singularities have been very ill appreciated by zoological writers in general.[2] These singularities would require almost a volume to describe properly. The best account of them is unquestionably that given in 1813 by Montagu (*Suppl. Orn. Dict.*), who seems to have been particularly struck by the extraordinary peculiarities of the species, and, to investigate them, expressly visited the fens of Lincolnshire, possibly excited thereto by the example of Pennant, whose information, personally collected there in 1769, was of a kind to provoke further enquiry, while Daniel (*Rural Sports*, iii. p. 234) had added some other particulars, and subsequently Graves (*Brit. Orn.* iii.) in 1816 repeated in the same district the experience of his predecessors. Since that time the great changes produced by the drainage of the fen-country have banished this species from nearly the whole of it, so that Lubbock (*Fauna Norf.* pp. 68-73; ed. 2, Southwell, pp. 102, 103) and Stevenson (*Birds Norf.* ii. pp. 261-271) can alone be cited as modern witnesses of its habits in England, while the trade of netting or snaring Ruffs and fattening them for the table has for many years ceased.[3]

The cock-bird, when out of his nuptial attire, or, to use the fenman's expression, when he has not "his show on," and the hen at all seasons, offer no very remarkable deviation from ordinary

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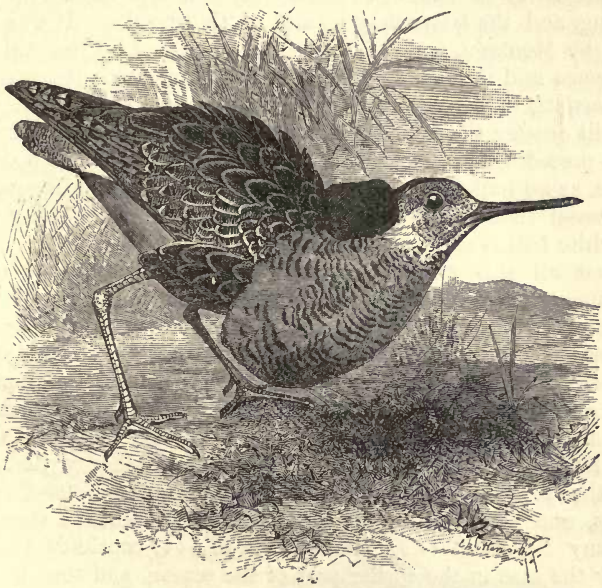
[1] This "ruff" has been compared to that of Elizabethan or Jacobean costume, but it is essentially different, since that was open in front and widest and most projecting behind, whereas the bird's decorative apparel is most developed in front and at the sides and scarcely exists behind. It seems to be at present unknown whether the bird was named from the frill, or the frill from the bird. In the latter case the name should possibly be spelt Rough (*cf.* "rough-footed" as applied to Fowls with feathered legs), as in 1666 Merrett (*Pinax*, p. 182) had it.

[2] Mr. Darwin, though frequently citing (*Descent of Man and Sexual Selection*, i. pp. 270, 306; ii. pp. 41, 42, 48, 81, 84, 100, 111) the Ruff as a witness in various capacities, most unfortunately seems never to have had its peculiarities presented to him in such a form that he could fully perceive their bearings. Though the significance of the lesson that the Ruff may teach was hardly conceivable before he began to write, the fact is not the less to be regretted that he never elucidated its importance, not only in regard to "Sexual Selection," but more especially with respect to "Polymorphism."

[3] I can well recollect considerable numbers, both alive and dead, being annually imported from Holland; but I believe that this practice is now given up.

Sandpipers, and outwardly[1] there is nothing, except the unequal size of the two sexes, to rouse suspicion of any abnormal peculiarity. But when spring comes all is changed. In a surprisingly short time the feathers clothing the face of the male are shed, and their place is taken by *papillæ* or small caruncles of bright yellow or pale pink. From each side of his head sprouts a tuft of stiff curled feathers, giving the appearance of long ears, while the feathers of the throat change colour, and beneath and around it sprouts the frill or ruff already mentioned. The feathers which form this remarkable adornment, almost unique among birds, are, like those of the "ear-tufts," stiff and incurved at the end, but much longer—measuring more than two inches. They are closely arrayed, capable of depression or elevation, and form a shield to the front of the breast impenetrable by the bill of a rival. More extraordinary than this, from one point of view, is the great variety of coloration that obtains in these temporary outgrowths. It has often been said that no one ever saw two Ruffs alike. That is perhaps an over-statement; but, considering the really few colours that the birds exhibit, the variation is something marvellous, so that fifty examples or more may be compared without finding a very close resemblance



Ruff.

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[1] Internally there is a great difference in the form of the posterior margin of the sternum, as long ago remarked by Nitzsch.

between any two of them, while the individual variation is increased by the "ear-tufts," which generally differ in colour from the frill, and thus produce a combination of diversity. The colours range from deep black to pure white, passing through chestnut or bay, and many tints of brown or ashy-grey, while often the feathers are more or less closely barred with some darker shade, and the black is very frequently glossed with violet, blue or green — or, in addition spangled with white, grey or gold-colour. The white, on the other hand, is not rarely freckled, streaked or barred with grey, rufous-brown or black. In some examples the barring is most regularly concentric, in others more or less broken-up or undulating, and the latter may be said of the streaks. It was ascertained by Montagu, and has since been confirmed by the still wider experience and if possible more carefully-conducted observation of Mr. Bartlett, that every Ruff in each successive year assumes tufts and frill exactly the same in colour and markings as those he wore in the preceding season; and thus, polymorphic as is the male as a species, as an individual he is unchangeable in his wedding-garment —a lesson that might possibly be applied to many other birds. The white frill is said to be the rarest.

That all this wonderful "show" is the consequence of the polygamous habit of the Ruff can scarcely be doubted. No other species of Limicoline bird has, so far as is known, any tendency to it. Indeed, in many species of *Limicolæ*, as the DOTTEREL, the GODWITS, PHALAROPES and perhaps some others, the female is larger and more brightly coloured than the male, who in such cases seems to take upon himself some at least of the domestic duties. Both Montagu and Graves, to say nothing of other writers, state that the Ruffs, in England, were far more numerous than the Reeves, and their testimony can hardly be doubted; though in Germany Naumann (*Vög. Deutschl.* vii. p. 544) considers that this is only the case in the earlier part of the season, and that later the females greatly outnumber the males. It remains to say that the moral characteristics of the Ruff exceed even anything that might be inferred from what has been already stated. By no one have they been more happily described than by Wolley, in a communication to Hewitson (*Eggs of Brit. Birds*, ed. 3, p. 346), as follows:—

> "The Ruff, like other fine gentlemen, takes much more trouble with his courtship than with his duties as a husband. Whilst the Reeves are sitting on their eggs, scattered about the swamps, he is to be seen far away flitting about in flocks, and on the ground dancing and sparring with his companions. Before they are confined to their nests, it is wonderful with what devotion the females are attended by their gay followers, who seem to be each trying to be more attentive than the rest. Nothing can be more expressive of humility and ardent love than some of the actions of the Ruff. He throws himself prostrate on the ground, with

every feather on his body standing up and quivering; but he seems as if he were afraid of coming too near his mistress. If she flies off, he starts up in an instant to arrive before her at the next place of alighting, and all his actions are full of life and spirit. But none of his spirit is expended in care for his family. He never comes to see after an enemy. In the [Lapland] marshes, a Reeve now and then flies near with a scarcely audible *ka-ka-kuk*; but she seems a dull bird, and makes no noisy attack on an invader."

Want of space forbids a fuller account of this extremely interesting species. Its breeding-grounds extend from Great Britain[1] across northern Europe and Asia; but the birds become less numerous towards the east. They winter in India, reaching even Ceylon, and Africa as far as the Cape of Good Hope. The Ruff also occasionally visits Iceland, and there are several well-authenticated records of its occurrence on the eastern coast of the United States, while an example is stated (*Ibis*, 1875, p. 332) to have been received from the northern part of South America.

RUNNER, a local name for the Water-RAIL (p. 763).

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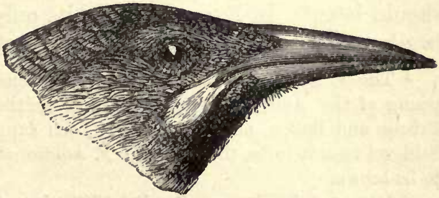
SACRUM, see SKELETON.

SADDLE-BACK, in Britain and North America, a local name for the adult of either of the Black-backed GULLS, *Larus marinus* and *fuscus*; but in New Zealand applied to *Creadion*, a genus founded in 1816 by Vieillot (*Analyse*, p. 34) of which the *Sturnus caruncolatus* of Gmelin, based on the Wattled Stare of Latham (*Gen. Synops.* iii. p. 9, pl. 36) is usually considered the type.[2] Its real affinity must be regarded as doubtful; for, like several other forms of the New-Zealand Region, it does not enter readily into any of the recognized Families of Birds, and thus has been placed among the *Sturnidæ* or *Corvidæ*, while it very possibly



CREADION. (From Buller.)

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[1] In England of late years it has been known to breed only in one locality, the name or situation of which it is not desirable to publish.

[2] This is not to be confounded with the *Anthochæra carunculata*, which has also been called *Creadion carunculatus* (Vieillot, *Encycl. Méthod.* ii. p. 874) and is a HONEY-SUCKER.

represents an earlier and more generalized form from which both may have sprung. That point must be left to future examination (which may be hoped for before extirpation has done its work), meanwhile it is enough to remark that the habits, as described by Sir W. Buller (*B. New Zeal.* ed. 2, i. pp. 18-20), of the Saddle-back of New Zealand shew little trace of agreement with those of either of the Families to which it has been assigned, and that the bird derives its name from the distribution of its strongly-contrasted colours, black and ferruginous, of which the latter covers the shoulders and back in a way suggestive of saddle-flaps. A second species described by Sir Walter in 1865 (*Essay Orn. N. Z.* p. 10), under the name of *C. cinereus*, was subsequently repudiated by him (*B. N. Z.* ed. 1, p. 149), but in 1888 was restored (*op. cit.* ed. 2, i. p. 21). It is said to be known as the Jack-bird.

SAGE-COCK, *Centrocercus urophasianus* (GROUSE, p. 394), the "sage" being an *Artemisia*.

SAINT CUTHBERT'S DUCK, a local name of the EIDER (p. 192).

SAKER, Fr. *Sacre*—said to be from the Arabic *Saqr* (= Falcon) and to have no connexion, as was once thought, with the Latin *Sacer*, a translation of ἱέραξ (=Hawk)—a species of FALCON which was allowed to drop almost out of knowledge with the neglect of Falconry, so that though some of the older systematists recognized a *Falco sacer*,[1] they had but little acquaintance with it, and mostly described it at second hand. It had been especially confounded with the LANNER, and figured under that name in the works of Naumann and Gould. To Schlegel, in 1844 (*Rev. Crit.* pp. ii. 9; *Traité de la Fauconnerie*, pp. 17-19, pl.), is due the disentanglement of the complication, and the placing of the species on a sound base, yet doubt may still be entertained as to the scientific name it should bear.[2] In Europe it inhabits only the south-eastern portion, beginning with Bohemia,[3] but in North Africa it ranges from

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[1] The *F. sacer* of J. R. Forster (*Phil. Trans.* lxii. p. 383) was evidently the young of the American GOSHAWK, and neither (as he thought) the *Sacre* of Brisson and Buffon, nor (as has lately been supposed) the young of *F. gyrfalco*. Schlegel took it to be the young of *F. candicans*, which he at that time believed to be brown.

[2] It cannot be *F. sacer*, Gmelin 1788, since that was anticipated by Forster in 1772 (see preceding note). According to most synonymies, *F. cherrug*, J. E. Gray (*Ill. Ind. Zool.* pl. 25), is next in point of time, and perhaps should stand. It is certainly the *F. cyanopus* of Thienemann (*Rhea*, pp. 39, note, and 62, pls. i. and ii.) in 1846-49.

[3] Messrs. Salvin and Brodrick (*Falconry in the British Islands*, p. 96) say that in 1848 Mr. A. C. Cochrane obtained breeding birds in Hungary, and twelve years later Mr. Hudleston took a nest in the Dobrudska (*Ibis*, 1860, p. 377, pl. xii. fig. 1).

Morocco to Egypt, and thence across Asia to north-eastern China, being highly esteemed by the falconers of that tract of country, as well as by those of India, to whom it is known as the *Cherrug*, though it there occurs only as a cold-weather visitant (*cf.* Jerdon, *Ibis*, 1871, pp. 238-240), its place as a native being taken by its smaller relative the LUGGAR, which it a good deal resembles in its generally dull-coloured plumage. Falcons, however, are met with as large as the Saker or larger, but coloured almost like a hen KESTREL, and on such a bird was founded the *F. milvipes* of Hodgson, published as a bare name in 1844 (*Zool. Miscell.* p. 81). Some authors appear still to consider this a distinct species, but the late Mr. Gurney referred it to the Saker (*Ibis*, 1882, pp. 444-447; *List Diurn. B. Prey*, p. 110). In India the Saker is flown chiefly at hares, small deer and the larger birds, as Bustards, Cranes and Kites, often shewing remarkable sport with the last, yet in its wild state it preys chiefly on rats, lizards and even insects, and when trained for a more powerful quarry it has to be drugged to give it courage.

SANDERLING (Icel. *Sanderla*[1]), one of the commonest and most widely-ranging of the LIMICOLÆ that frequent our shores, and one in which great interest has been manifested, from the fact that for a very long while naturalists were unable to reach its breeding-haunts, though they were asserted to have been found in the Parry Islands; and Iceland was also suspected to be one of them. All doubt was, however, put aside when it became known that, in June 1863, its nest and eggs had been discovered near Franklin Bay by Mr. MacFarlane (*Proc. U. S. Nat. Mus.* xiv. p. 427), a discovery the more fortunate since the species is rare in that quarter, and he was never able to obtain a second nest. One of the eggs, on being sent to England by the Smithsonian Institution (for whom that gentleman, at the instigation of the late Prof. Baird, was collecting) was described and figured[2] (*Proc. Zool. Soc.* 1871, p. 76, pl. iv. fig. 2). Shortly after, the eggs collected by the German North-Pole Expedition were received in this country and among them were ten, in a more or less fragmentary condition, obtained by Dr. Pansch on the east coast of Greenland, which, by an exhaustive process, were shewn (*tom. cit.* p. 546; *Wissensch. Ergebn. deutsch. Nordpolarfahrt*, pp. 204, 240-242) to be those of this species, while the series also served to corroborate the suspicion before entertained of the breeding of this species in Iceland, since they shewed that an egg which had been brought thence in 1858 could hardly belong to any other. In the Arctic Expedition of 1875-6 Col. Feilden (*Ibis*, 1877, p. 406, and Nares, *Voyage to the Polar Sea*, ii. p. 210, pl.) found a nest with two eggs, which fully agree with the rest. Thus it will appear that the breeding-range of this species, so far as is at present known with certainty, extends only from Iceland (say long. 15° W.) to Point Barrow (say long. 155° W.), and that interruptedly, though it is just possible that some part of the Arctic coast of Asia may have to be included, but not that of Europe, Nova Zembla or Spitsbergen.[1] In autumn the Sanderling is well known to pass southward across, or along the coast of all the great continents, though it winters in no inconsiderable numbers in temperate climes, our own, for example; but, while it reaches Patagonia in the New World and the Cape of Good Hope in the Old, it seems mostly content to stay on the northern margin of the Arabian Sea and Bay of Bengal, only rarely venturing to Ceylon or Burma; and, hitherto unknown to the Malay Peninsula, has been observed but on two of the islands (Borneo and Java) of that Archipelago. Yet it appears on the Chinese sea-board generally, and has even been obtained in New South Wales, while its occurrence, perhaps more or less accidental, has been recorded at spots distant enough from its true home—such as the Sandwich Islands, the Galapagos and the Marshall group in the Pacific, the Lacdivies, Aldabra and Madagascar in the Indian Ocean, and the Canaries, Madeira and Bermuda in the Atlantic, to say nothing of the Antilles. Observation seems to shew that in such outlying places it appears less frequently and more irregularly than several of its wandering kindred, and wherever it tarries, whether on passage or to winter, it rather prefers the drier sandy shores, where it consorts with PLOVERS of the genus *Ægialitis*, to the expanses of mud or marsh that so many of its allies affect.

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[1] A name often confounded with *Sand-lóa*, the Icelandic name of the Ringed PLOVER, whereby several mistakes have arisen.

[2] The egg had been professedly figured before both by Thienemann (*Fortpflanz. gesammt. Vögel*, t. lxii. fig. 2) and Bædeker (*Eier Europ. Vögel*, t. lxxi. fig. 5), but no doubt their specimens had been wrongly assigned, as were many others in various collections.

The Sanderling belongs to the group *Tringinæ* (SANDPIPER) but is always recognizable by wanting the small hind toe, a distinction that justifies its generic separation, and it has long been the *Calidris arenaria* of ornithology.[2] It undergoes a seasonal change quite as remarkable as the KNOT and some others, its winter-suit being of a beautiful silvery-grey, making the bird at times look almost wholly white, but in spring the head, back and breast become mottled with rust-colour and black, the former predominating in the form of a broad edging to the feathers; but the belly and lower parts are white all the year round.

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[1] It is pretty obvious that there must be places in high northern latitudes where the Sanderling, the Knot and several other allied species breed in profusion.

[2] Linnæus described it twice, first as a *Charadrius* and then as a *Tringa*. The absence of the hallux induced many systematists to put it among the Plovers.

SAND-GROUSE, the name[1] by which are commonly known the members of a small but remarkable group of birds frequenting sandy tracts, and having their feet more or less clothed with feathers after the fashion of GROUSE, to which they were originally thought to be closely allied, and the species first described were by the earlier systematists invariably referred to the genus *Tetrao.* Their separation therefrom is due to Temminck, who made for them a distinct genus which he called *Pterocles,*[2] and his view, as Lesson tells us (*Traité*, p. 515), was subsequently corroborated by De Blainville; while in 1831 Bonaparte (*Saggio* &c. p. 54) recognized the group as a good Family, *Pediophili* or *Pteroclidæ.* Further investigation of the osteology and pterylosis of the Sand-Grouse revealed still greater divergence from the normal GALLINÆ, as well as several curious resemblances to the Pigeons; and Prof. Huxley (*Proc. Zool. Soc.* 1868, p. 303) for sufficiently weighty reasons, proposed to regard them, under the name of PTEROCLOMORPHÆ, as forming a group equivalent to the ALECTOROMORPHÆ and PERISTEROMORPHÆ.[3] The group consists of two genera[4]—*Pterocles*, with about fifteen species, and *Syrrhaptes*, with two. Of the former, two species inhabit Europe, *P. arenarius*, the Sand-Grouse proper, and that which is usually called *P. alchata*, the Pin-tailed Sand-Grouse. The European range of the first is practically limited to Portugal, Spain and the southern parts of Russia, while the second inhabits also the south of France, where it is generally known by its Catalan name of "*Ganga*," or locally as "*Grandaulo*," or, strange to say, "*Perdrix d'Angleterre.*" Both species are also abundant in Barbary, and have been believed to extend eastwards through Asia to India, in most parts of which country they seem to be only winter-visitants; but in 1880 Herr Bogdanow pointed out (*Bull. Ac. Sc. Petersb.* xxvii. p. 164) a slight difference of coloration between eastern and western examples of what had hitherto passed as *P. alchata*; and the difference, if found to be constant, may require the specific recognition of each. India, where these birds are commonly known to sportsmen as "Rock-Pigeons," moreover, possesses five other species of *Pterocles*, of which however only one, *P. fasciatus*, is peculiar to Asia, while the others inhabit Africa as well, and all the remaining species belong to the Ethiopian Region—one, *P. personatus*, being peculiar to Madagascar, and four occurring in or on the borders of Cape Colony.

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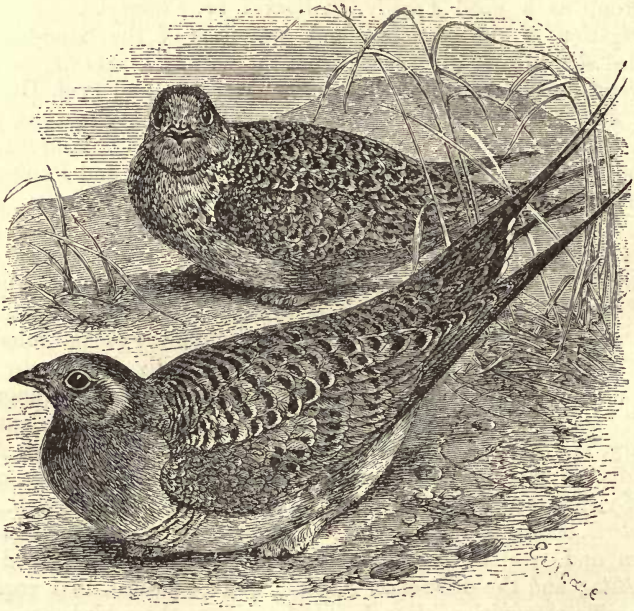
[1] It seems to have been first used by Latham in 1783 (*Gen. Synops.* iv. p. 751) as the direct translation of the name *Tetrao arenarius* given by Pallas.

[2] He states (*Man. d'Orn.* ed. 2, ii. p. 474, *note*) that he published this name in 1809; but hitherto research has failed to find it used until 1815.

[3] Some more recent writers, recognizing the group as a distinct Order, have applied to it the name of "PTEROCLETES," while another calls it *Heteroclitæ.* The former of these words is based on a grammatical misconception, while the use of the latter has long since been otherwise preoccupied in zoology. If there be need to set aside Prof. Huxley's term, Bonaparte's *Pediophili* (as above mentioned) may be accepted, and indeed has priority of all others.

[4] Bonaparte (*Compt. rend.* xiii. p. 880) proposed to separate the Pin-tailed Sand-Grouse as *Pteroclurus*, and therein has been followed by Mr. Ogilvie Grant (*Cat. B. Br. Mus.* xxii. pp. 2, 6), but this separation seems needless.

Syrrhaptes, though in general appearance resembling *Pterocles*, has a conformation of foot quite unique among birds, the three anterior toes being encased in a common "podotheca," which is covered to the claws with hairy feathers, so as to look much like a fingerless glove, while the hind toe is wanting. The two species of *Syrrhaptes* are *S. tibetanus*—the largest Sand-Grouse known—inhabiting the country whence its trivial name is derived, and *S. paradoxus*, ranging from Northern China across Central Asia to the confines of Europe, which it occasionally, and in a marvellous manner, invades, as has been already mentioned (MIGRATION, p. 571). Here the subject, which has a large literature of its own,[1] must be treated very concisely. Hitherto known only as an inhabitant of the Tartar steppes, a single example was obtained at



SYRRHAPTES PARADOXUS. (From the Prospectus of Yarrell's *British Birds*, ed. 4.)

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[1] Dr. Leverkühn has been at great pains to compile a bibliography of *Syrrhaptes* which will be found in the *Monatsschrift des Deutschen Verein zum Schutze der Vogelwelt* for 1888-92.

Sarepta on the Volga in the winter of 1848. In May 1859 a pair is said to have been killed in the Government of Vilna on the western borders of the Russian Empire, and a few weeks later five examples were procured, and a few others seen, in Western Europe —one in Jutland, one in Holland, two in England and one in Wales, beside which a sixth was killed near Perpignan at the foot of the Pyrenees in the October following (*Ibis*, 1871, p. 223). In 1860 another was obtained at Sarepta; but in May and June 1863 a horde, computed to consist of at least 700 birds, overran Europe —reaching Sweden, Norway, the Færoes and Ireland in the north-west, and in the south extending to Rimini on the Adriatic and Biscarolle on the Bay of Biscay. On the sandhills of Jutland and Holland some of these birds bred, but war was too successfully waged against the nomads to allow of their establishing themselves, and a few survivors only were left to fall to the gun in the course of the following winter and spring.[1] In 1872 and 1876 there were two small visitations; but from the former, observed in only two localities—one on the coast of Northumberland, the other on that of Ayrshire, both in the month of June—no specimen is known to have been obtained, while the latter was observed in three localities —one near Winterton in Norfolk in May, another near Modena in Italy in June, and the third in the county Wicklow in Ireland, where at least one was killed. In 1888 occurred an irruption in numbers quite incalculable. The excess of observations over those of 1863 is no doubt due in some measure to the increased attention paid to it, mainly in consequence of a warning issued (29th April) by Prof. R. Blasius of Brunswick so soon as the movement was known to him, but still there is proof of the invasion being on a much larger scale. Most of the features of 1863 were repeated, and the general line taken was much as in that year, suggesting the same "radiant point" (to use an astronomical phrase) in both cases;[2] but, owing to the meagre reports that have reached us from the East, that point is still to seek, and its determination must await another opportunity. Some differences, however, are to be noted: the event took place nearly a month earlier in the year, and the passage across Europe soon expanded more widely. In the north-east the Gulf of Finland was crossed to Helsingfors, but the most northerly (Roraas in Norway) and westerly (Belmullet in Ireland) points reached were only a little further than the limits of 1863. Southward a great extension was shewn not only in Italy

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[1] *Ibis*, 1864, pp. 185-222. A few additional particulars which have since become known to me are here inserted.

[2] But the species seems to have established itself in 1876 on the left bank of the Lower Volga (K. G. Henke, *Bull. Soc. Nat. Mosc.* 1877, i. p. 119), and the incursionists of 1888 may have had their origin there. South-west of the Caspian the species is a rare visitant.

(Santa Severa, not far from Rome) but in Spain (Albufera of Valencia), that country being now invaded for the first time. If records are to be trusted, flocks of many hundreds appeared on the steppes of Orenburg at the end of February (*qu.* O.S. ?), all moving due westward, and a month later a bird was killed at Saratov (Baron A. von Krüdener, *Zool. Gart.* 1888, p. 282). On the 4th April, from 30 to 40 were seen at Selb on the boundary of Bohemia and Bavaria. On the 17th Husum in Sleswick was reached, and Heligoland on the 8th May—but there is reason to believe that one of the Farne Islands was visited on the 6th, and certainly within a very few days the British Islands were completely occupied,[1] while after that dates become of little value since, as before, the movement was practically unchecked, though doubtless here and there affected in some measure by local causes. Just as when a billow has broken upon the beach it is a thousand accidents that determine the way in which the spray is scattered, so was it with these birds, for no sooner had they arrived than they were hastening in one direction or another in quest of food, and with their wonderful wing-power the search was pretty easy. A suitable place being found, they occupied it in parties of from 6 to 8, or 20 to 30—and so far as Britain is concerned it was plain that they were nearly all paired and ready to breed. This object they effected in several localities, both here and on the continent; but many false rumours, some of them intentionally set about, were current. As regards England, two nests were certainly found in the East Riding of Yorkshire,[2] and in Scotland a young bird was found by Mr. Scott, a gamekeeper, on the Culbin Sands in Moray. This was not preserved, but in the following year he obtained another, which was subsequently exhibited at the Newcastle meeting of the British Association, and from it the first description and figure of the chick were published.[3] Notwithstanding the destruction carried on, small parties or even considerable flocks were observed from time to time during the autumn of 1888 in one part of Europe or another, but gradually their numbers dwindled, and the spring and summer of 1889[4] saw but few remaining. Some, however, contrived to get through another winter in Great Britain, and if rumour may be credited, all had not disappeared even in 1892, but this is by no means certain. The interest attaching to the several European irruptions has almost made ornithologists forgetful of the somewhat similar inroad upon the plains between Pekin and Tientsin in China in the autumn of 1860, which affords another proof of the propensity of the species to irregular migration.[1]

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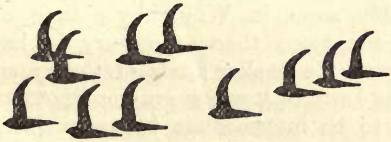
[1] Mr. W. Evans computes the garrison of Scotland at from 1500 to 2000 birds.

[2] I was indebted to the kindness of Mr. J. C. Swailes for the opportunity of seeing the eggs there obtained.

[3] In numerous instances, especially in Germany, the young of *Crex pratensis* seem to have been taken for those of *Syrrhaptes.* Some old birds taken alive bred in the aviary of Herr J. B. Christensen, near Copenhagen, and after an incubation of 23 days several eggs were hatched, from which, in 1891, one young bird reached maturity, as he kindly informed me. In the zoological garden of Amsterdam eggs were also laid and some hatched after an incubation of 28 days; but it does not appear that any produce was reared (*Ibis,* 1890, p. 466).

[4] In 1888 an Act of Parliament was passed to protect these birds, but as it was not to come into operation until February 1889 it was a futile measure.

Externally all Sand-Grouse present an appearance so distinctive that nobody who has seen one of them can be in doubt as to any of the rest. Their plumage assimilates in general colour to that of the ground they frequent (*cf.* GEOGRAPHICAL DISTRIBUTION, p. 336), being above of a dull ochreous hue, more or less barred or mottled by darker shades, while beneath it is frequently varied by belts of deep brown intensifying into black. Lighter tints are, however, exhibited by some species—the drab merging into a pale grey, the buff brightening into a lively orange, and streaks or edgings of an almost pure white relieve the prevailing sandy or fawn-coloured hues that especially characterize the group. The sexes seem always to differ in plumage, that of the male being the brightest and most diversified. The expression is decidedly Dove-like, and so is the form of the body, but their appearance when flying in a flock is more like that of Plovers.[2] The long wings, the outermost primary of which in *Syrrhaptes* has its shaft produced into an attenuated filament, are in all the species worked by exceedingly powerful muscles, and in several forms the middle rectrices are likewise protracted and pointed, so as to give to their wearers the name of Pin-tailed Sand-Grouse. The nest is a shallow hole in the sand. Three seems to be the regular complement of eggs laid in each nest, but there are writers who declare (most likely in error) that the full number in some species is four. These eggs are of peculiar shape, being almost cylindrical in the middle and nearly alike at each end, and are of a pale earthy colour, spotted, blotched



SYRRHAPTES ON THE WING.
(Wilton, Norfolk, 8th October 1888.)

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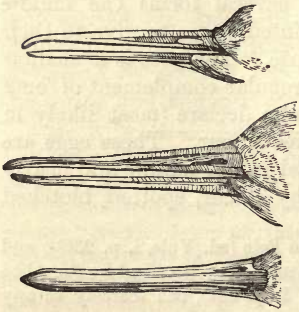
[1] It appears to be the "Barguerlac" of Marco Polo (ed. Yule, i. p. 239); and the "Loung-Kio" or "Dragon's Foot," so unscientifically described by the Abbé Huc (*Souvenirs d'un Voyage dans la Tartarie,* i. p. 244), can scarcely be any thing else than this bird.

[2] I write with especial reference to *Syrrhaptes,* a flock of which may be easily mistaken for one of Golden Plovers, as the figure shews, though the former have the wing more curved and keep stroke with far more regularity, their "time" (as an oarsman would say) being absolutely perfect.

or marbled with darker shades, the markings being of two kinds, one superficial and the other more deeply seated in the shell. The young are hatched fully clothed in down (*P. Z. S.* 1866, pl. ix. fig. 2), and though not very active would appear to be capable of locomotion soon after birth. Morphologically generalized as the Sand-Grouse undoubtedly are, no one can contest the extreme specialization of many of their features, and thus they form a very instructive group. The remains of an extinct species of *Pterocles*, *P. sepultus*, intermediate apparently between *P. alchata*, and *P. gutturalis*, have been recognized in the Miocene caves of the Allier by Prof. A. Milne-Edwards (*Ois. foss. France*, p. 294, pl. clxi. figs. 1-9); and, in addition to the other authorities on this very interesting group of birds already cited, reference may be made to Mr. Elliot's "Study" of the Family (*Proc. Zool. Soc.* 1878, pp. 233-264) and Dr. Gadow, "On certain points in the Anatomy of *Pterocles*" (*op. cit.* 1882, pp. 312-332).

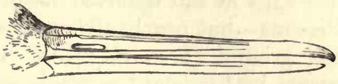
SANDPEEP, used in America for SANDPIPER.

SANDPIPER (Germ. *Sandpfeifer*), according to Willughby in 1676 the name given by Yorkshiremen to the bird now most popularly known in England as the "Summer-Snipe,"—the *Tringa hypoleucos* of Linnæus and the *Totanus*, *Actitis* or *Tringoides hypoleucus* of later writers,—and probably even in Willughby's time of much wider signification, as for more than a century it has certainly been applied to nearly all the smaller kinds of the group termed by modern ornithologists LIMICOLÆ which are not PLOVERS or SNIPES, but may be said to be intermediate between them. Placed by most systematists in the Family *Scolopacidæ*, the birds commonly called Sandpipers seem to form three sections, which have been often regarded as subfamilies—*Totaninæ*, *Tringinæ* and *Phalaropodinæ*, the last of which has already been treated (PHALAROPE), and in some classifications takes the higher rank of a Family — *Phalaropodidæ*. The distinctions between *Totaninæ* and *Tringinæ*, though believed to be real, are not easily drawn, and space is wanting here to describe them minutely. Both of these groups have been the sport of nomenclators and systematists, so that a vast mass of synonymy, puzzling to unravel, and many superfluous genera have been introduced. The most obvious distinctions may be said to lie in the form of the tip of the bill (with which is associated a less or greater development of the sensitive nerves



TRINGA. (After Swainson.)

running almost if not quite to its extremity, and therefore closely connected with the mode of feeding) and in the style of plumage—the *Tringinæ*, with blunt and flexible bills, mostly assuming a summer-dress in which some tint of chestnut or reddish-brown is very prevalent, while the *Totaninæ*, with more acute and stiffer bills, display no such lively colours. Furthermore, the *Tringinæ*, except when actually breeding, frequent the sea-shore much more than do the *Totaninæ*.[1] To the latter belong the GREENSHANK and REDSHANK, as well as the Common Sandpiper of English books, the "Summer-Snipe" above-mentioned, a bird hardly exceeding a Skylark in size, and of very general distribution throughout the British Islands, but chiefly frequenting clear streams, especially those with a gravelly or rocky bottom, and most generally breeding on the beds of sand or shingle on their banks. It usually makes its appearance in May, and thenceforth during the summer months may be seen in pairs skimming gracefully over the water from one bend of the stream to another, uttering occasionally a shrill but plaintive whistle, or running nimbly along the margin, the mouse-coloured plumage of its back and wings making indeed but little show, though the pure white of its lower parts often renders it conspicuous. The nest, in which four eggs are laid with their pointed ends meeting in its centre (as is usual among Limicoline birds), is seldom far from the water's edge, and the eggs, as well as the newly-hatched and down-covered young, so closely resemble the surrounding pebbles that it takes a sharp eye to discriminate them. Later in the season family-parties may be seen about the larger waters, whence, as autumn advances, they depart for their winter-quarters. The Common Sandpiper is found over the greater part of the Old World. In summer it is the most abundant bird of its kind in the extreme north of Europe, and it extends across Asia to Japan. In winter it makes its way to India, Australia and the Cape of Good Hope. In America its place is taken by a closely-kindred species, which is said to have also occurred in England—*T. macularius*, the "Peetweet," or Spotted Sandpiper, so called from its usual cry, or from the almost circular marks which spot its lower plumage. In habits it is very similar to its congener of the Old World, and in winter it migrates to the Antilles and to Central and South America. Of other *Totaninæ*, one of the most remarkable is that to which the inappropriate name of Green Sandpiper has been



TOTANUS. (After Swainson.)

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[1] There are unfortunately no English words adequate to express these two sections. By some British writers the *Tringinæ* have been indicated as "Stints," a term cognate with Stunt and not wholly applicable to all of them, while recent American writers restrict to them the name of "Sandpiper," and call the *Totaninæ*, to which that name is especially appropriate, "Willets."

assigned, the *Totanus* or *Helodromas ochropus* of ornithologists, which most curiously differs (so far as is known) from all others of the group both in its osteology[1] and mode of nidification, the hen laying her eggs in the deserted nests of other birds—Jays, Thrushes or Pigeons—but nearly always at some height (from 3 to 30 feet) from the ground (*Proc. Zool. Soc.* 1863, pp. 529-532). This species occurs in England the whole year round, and is presumed to have bred here, though the fact has never been satisfactorily proved, and our knowledge of its erratic habits comes from naturalists in Pomerania and Sweden; yet in the breeding-season, even in England, the cock-bird has been seen to rise high in air and perform a variety of evolutions on the wing, all the while piping what, without any violence of language, may be called a song. This Sandpiper is characterized by its dark upper plumage, which contrasts strongly with the white of the lower part of the back and gives the bird as it flies away from its disturber much the look of a very large House-Martin. The so-called Wood-Sandpiper, *T. glareola*, which, though much less common, is known to have bred in England, has a considerable resemblance to the species last mentioned, but can at once be distinguished, and often as it flies, by the feathers of the axillary plume being white barred with greyish-black, while in the Green Sandpiper they are greyish-black barred with white. It is an abundant bird in most parts of northern Europe, migrating in winter very far to the southward.

Of the section *Tringinæ* the best known are the DUNLIN, the KNOT and the SANDERLING (the last to be distinguished from every other bird of the group by wanting a hind toe), while the Purple Sandpiper, *Tringa striata* or *maritima* is only somewhat less numerous, but is especially addicted to rocky coasts. The Curlew-Sandpiper, *T. subarquata*, appears not unfrequently, and is of especial interest since its nest has never been discovered, and none can point even approximately to any breeding-place for it, except it be, as Von Middendorff supposed, on the tundras of the Taimyr. The Little and Temminck's Stints, *T. minuta* and *T. temmincki*, are more regular in their visits, and have been traced to their homes in the most northern part of Scandinavia and the Russian Empire, but want of space forbids more than this record of their names; and, for the same reason, no notice can be taken of many other species, chiefly American, belonging to this group, with the exception of *T. maculata* or *pectoralis*, concerning which a few words must be said on account of the extraordinary faculty, first noticed by the late Mr. Edward Adams (*Proc. Zool. Soc.* 1859, p. 130), possessed by the male of puffing out its œsophagus, after the manner of a Pouter-Pigeon.

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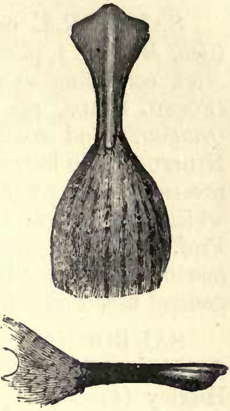
[1] It possesses only a single pair of posterior "emarginations" on its sternum, in this respect resembling the RUFF. Among the PLOVERS and SNIPES other similarly exceptional cases may be found.

This habit, unique, so far as is known, among the group, is indulged in during the breeding-season, and the inflation is accompanied by the utterance of a deep, hollow and resonant note, as subsequently observed by Mr. E. W. Nelson (*Auk*, 1884, pp. 218-221), who afterwards figured the bird (*N. H. Collect. Alaska*, pp. 108, 109, pl. vii.) in this extraordinary condition, when it presents almost the appearance of a Ruff, while his experience has been corroborated by Mr. Murdoch (*Rep. Internat. Pol. Exped. Point Barrow*, p. 111). Two other forms must however be mentioned.[1] These are the broad-billed Sandpiper, *T. platyrhyncha*, of the Old World, which seems to be more Snipe-like than any that are usually kept in this section, and the marvellous Spoon-billed Sandpiper, *Eurynorhynchus pygmæus* (*cf.* Harting, *Ibis*, 1869, pp. 426-434), the true home of which has still to be discovered, according to the experience of Baron Nordenskjöld in the memorable voyage of the 'Vega.'[2]


Eurynorhynchus.
(From *The Ibis*.)

SAND-PLOVER, a name given locally to Plovers of the genus *Ægialitis.*

SAND-RUNNER, like the foregoing, but perhaps sometimes used more for Sandpiper.

SAPSUCKER, a common name in North America for many of the smaller Woodpeckers, *Dendrocopus pubescens*, *villosus* and others, but strictly only applicable to *Sphyropicus varius*, which with its local forms, *nuchalis* and *ruber*, and congener *thyroideus*, has a lingual structure, first described by Macgillivray for Audubon (*Orn. Biogr.* v. pp. 537, 538), very different from that of most *Picidæ*, and a mode of feeding to correspond (*cf.* Coues, *Birds of the North West*, pp. 285-289).

SARUS (Hind. *Saras* and *Sarhans*), often corrupted into "Cyrus," the ordinary name for *Grus antigone*, one of the finest of the Cranes (p. 112).

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[1] Reference has already been made to the presumably extinct *Æchmorhynchus* (p. 712, note 2) and *Prosobonia* (pp. 225, 226), if the latter really belonged to this group.

[2] Mr. Seebohm's volume before mentioned (p. 733, note 2) *The Geographical Distribution of the Family Charadriidæ, or the Plovers, Sandpipers, Snipes and their allies*, contains an account of every species and figures of a great many of the Sandpipers. Yet a good work on the subject is still to be desired, especially if it will describe accurately the range of the various species, distinguishing between their summer-homes and their winter-resorts, while recording also their occasional wanderings.

SATIN-BIRD, one of the Bower-birds (p. 49), *Ptilorhynchus violaceus* or *holosericeus*, so-called from its glossy plumage.

SATIN-SPARROW, the name in Tasmania for *Myiagra nitida*, a Flycatcher.

SAURIURÆ or SAURIURI, Prof. Häckel's names in 1866 (*Gen. Morphol.* i. p. cxxxix.) for the first of his two Subclasses of *Aves*, consisting so far as is at present known of *Archæopteryx* (Fossil Birds, pp. 278-280), his second Subclass being named *Ornithuræ*, and composed of two "Legions," (1) *Autophagæ* or Nidifugæ, the latter therefore not used in the same sense as in the present work (p. 635); and (2) *Pædotrophæ* or Insessores (p. 459), which last differs from the meaning attached to it by Vigors. Prof. Huxley having adopted the modified term SAURURÆ as one of his Orders (*Proc. Zool. Soc.* 1867, p. 418), it has come into general use, while *Ornithuræ* may be said to have lapsed.[1]

SAUROGNATHÆ, the late Prof. W. K. Parker's name (*Trans. R. Micros. Soc.* 1872, p. 219) for the Celeomorphæ of Prof. Huxley (*Proc. Zool. Soc.*, 1867, p. 456), consisting of the *Picidæ* (Woodpecker) and *Iynginæ* (Wryneck), thereby raising them to the same rank as the latter's other Suborders of Carinatæ.

SAVANNA BLACKBIRD, a common West-Indian name of *Crotophaga ani* (Ani).

SAWBILL, a name commonly given to the Goosander and Merganser, and also used in some books for the Motmots.

SAW-SHARPENER, a widely-spread local name for the Great Titmouse, *Parus major*, from the peculiar song of the cock.

SAW-WHET, a little Owl, *Nyctala acadica*, so-called in Audubon's words (*Orn. Biogr.* ii. p. 567) from "the sound of its love-notes bearing a great resemblance to the noise produced by filing the teeth of a large saw."

SAYSIE, a name applied in South Africa to several Finches of the genus *Crithagra* (Layard, *B. S. Afr.* ed. 2, pp. 485-487).

SCALE-DUCK, a local name for the Sheld-drake.

SCAMEL, a word, used once by Shakespear (*Tempest*, Act II. Sc. ii., line 176), that has given rise to many conjectures (*cf.* Wright, *Cambr. Shakesp.* i. p. 51); but is commonly accepted as a bird's name, a signification rendered more likely by the fact that at Blakeney, on the coast of Norfolk, it was applied to a Godwit (Stevenson, *B. Norf.* ii. p. 260), though it is not to be supposed that Shakespear used it in that sense. It seems to be otherwise unknown, and the most plausible suggestions are that the word was a misprint for "Seamel" (*i.e.* SEA-MEW) or for "Stannel" (a KESTREL).

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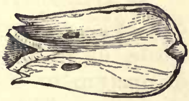
[1] Botanists, however, had made a prior application of *Saururæ*.

SCANSORES, Illiger's name in 1811 (*Prodr.* p. 194) for his First Order, made to contain 5 Families:—(1) *Psittacini*, with the genera *Psittacus* and *Pezoporus*; (2) *Serrati*, made up of *Ramphastos*, *Pteroglossus*, *Pogonias*, *Corythaix*, *Trogon* and *Musophaga*; (3) *Amphiboli*, including *Crotophaga*, *Scythrops*, *Bucco*, *Cuculus* and *Centropus*; (4) *Sagittilingues*, formed by *Iynx* and *Picus*; and (5) *Syndactyli*, consisting of *Galbula*.

SCAPULARS, a set of feathers on each side of a bird's dorsal surface, so called as lying along the *scapulæ* or shoulder-blades; but by some writers termed Humerals, since they run across the *humeri*. These feathers form part of the PARAPTERON of Illiger and Sundevall, and in some groups of birds are very conspicuous and characteristic.

SCARF (Icel. *Skarfr*), otherwise SCART, a local name for a CORMORANT or SHAG.

SCAUP, the wild-fowlers' ordinary abridgment of SCAUP-DUCK, meaning a Duck so called "because she feeds upon *Scaup*, *i.e.* broken shel-fish," as may be seen in Willughby's *Ornithology* (p. 365); but it would be more proper to say that the name comes from the "Mussel-scaups," or "Mussel-scalps,"[1] the beds of rock or sand on which mussels (*Mytilus edulis*, and other species) are aggregated—the *Anas marila* of Linnæus and *Nyroca* or *Fuligula marila* of modern ornithology, a very abundant bird around the coasts of most parts of the northern hemisphere, repairing inland in spring for the purpose of reproduction, though so far as is positively known hardly but in northern districts, as Iceland, Lapland, Siberia and the fur-countries of America. It was many years ago believed (*Edinb. N. Philos. Journ.* xx. p. 293) to have been found breeding in Scotland, but assertions to that effect have not been wholly substantiated, though apparently corroborated by some later evidence (*Proc. N. H. Soc. Glasg.* ii. p. 121, and *Proc. Phys. Soc. Edinb.* vii. p. 203). The Scaup-Duck has considerable likeness to the POCHARD, both in habits and appearance; but it much more generally affects salt-water, and the head of the male is black, glossed with green, and hence the name of "Black-head," by which it is commonly known in North America, where, however, a second species or race, smaller than the ordinary one, is also found, the *N.* or *F. affinis*. The



BILL OF SCAUP-DUCK.
(After Swainson.)

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[1] "Scalp" primarily signifies a shell; *cf.* Old Dutch *schelpe* and Old Fr. *escalope* (Skeat, *Etymol. Dictionary*, p. 528).

female Scaup-Duck can be readily distinguished from the Dunbird or female Pochard by her broad white face.

SCAURIE or SCOREY. In Orkney the young of the Herring-Gull is so-called (Niell, *Tour through Orkney and Shetland*, p. 201), and the name is perhaps elsewhere applied (Montagu, *Suppl. Orn. Dict.*) to that of some other species.

SCHIZOGNATHÆ, Prof. Huxley's second Suborder of Carinatæ, composed of six groups — Charadriomorphæ, Geranomorphæ, Cecomorphæ, Spheniscomorphæ, Alectoromorphæ and Peristeromorphæ — in all of which the vomer, however variable, always tapers to a point anteriorly, while behind it embraces the basisphenoidal rostrum between the palatals; but neither these nor the pterygoids are borne by its posterior divergent ends. The maxillopalatals are usually elongated, and, bending backward along their inner edge, leave a fissure (whence the name of the Suborder) between the vomer and themselves. In addition to these characters, the birds composing this group often want intrinsic muscles in the lower larynx, and never possess more than a single pair of them. With the exception of *Podicipes* (Grebe) all the genera which he had examined have two carotid arteries (*Proc. Zool. Soc.* 1867, pp. 426-435; 456-460).

SCHIZORHINAL, the epithet bestowed by Garrod (*Proc. Zool. Soc.* 1873, p. 36), in his first and crude systematic arrangement of Birds, on what appeared to him to be a "Suborder," in contradistinction to those possessing what he called the Holorhinal structure. This view was virtually abandoned by him within little more than twelve months (*op. cit.* 1874, pp. 111-123); but that fact has not hindered some writers from continuing to use these terms as if they had any taxonomic signification.

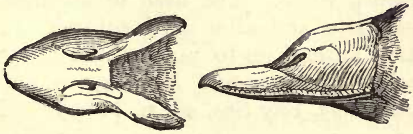
SCIZZORS-TAIL, *Milvulus forficatus*, one of the most beautiful of the *Tyrannidæ* (Tyrant), so called in some of the Southern States of North America from its habit of opening and closing its long and deeply-forked tail like the blades of a pair of scissors. It is only an accidental wanderer to the Northern or even the Middle States, but is or was abundant on the prairies of Texas, and inhabits Mexico and Central America as far as Costa Rica. Without possessing any tints that may be called brilliant in its plumage, the delicate harmony of lavender-grey and rose-red that it displays —and it is very fond of the display—as well as its graceful form combine to make its appearance most engaging, and almost justify its being known, according to Mr. Dresser (*Ibis*, 1865, p. 472), in Western Texas as the "Bird-of-Paradise"—for its long tail (10 inches) helps to give it that name, and its habits render it conspicuous. It is of a fearless disposition and quarrelsome towards its fellows, though it will join with them in playful and lofty flights, in which all will shoot rapidly upwards, making the strokes of their wings resound so as to be heard at a considerable distance. The same kind of behaviour has been observed in the allied *M. tyrannus*, a more soberly-coloured and even longer-tailed bird, which, though properly a native of Central and pretty generally of South America, occasionally strays to the northern part of that continent, and has occurred more than once within the limits of the United States. Mr. Hudson (*Argent. Orn.* i. p. 161; *Nat. in La Plata*, pp. 271, 272) states that the birds of this species, though not gregarious, rise just before sunset to the tree-tops, and after calling to one another with loud and excited chirps, "mount upwards like rockets, to a great height in the air; then, after whirling about for a few moments, they precipitate themselves downwards with the greatest violence, opening and shutting their tails during their wild zigzag flight, and uttering a succession of sharp, grinding notes."

SCOBBY, a north-country name for the Chaffinch (p. 82).

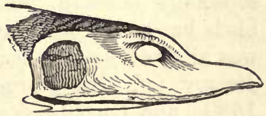
SCOLDER—perhaps from Icel. *Skjöldr* (*cf.* Sheld-drake), or possibly from Icel. *Tjaldr*; Færoese *Tjaldur*,—in Orkney a name for the Oyster-catcher (p. 681); but, according to Mr. Trumbull (*Names & Portr. B.* p. 89), on the east coast of North America for the Long-tailed Duck (see Hareld, p. 406).

SCOOPER, said to have been a local name for the Avoset (p. 23).

SCOTER, a word of doubtful origin, perhaps a variant of SCOUT—one of the many local names shared in common by the Guillemot and the Razorbill,—or perhaps primarily connected with Coot,[1]—the English name of the *Anas nigra* of Linnæus, which with some allied species has been justifiably placed in a



Scoter.



Surf-Duck.

(After Swainson.)

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[1] In the former case the derivation seems to be from the O. Fr. *Escoute*, and that from the Latin *auscultare* (*cf.* Skeat, *Etymol. Dict.* p. 533), but in the latter from the Dutch *Koet* (Coot), which is said to be of Celtic extraction—*Cwtiar* (*op. cit.* p. 134). The French *Macreuse*, possibly from the Latin *macer*, indicating a bird that may be eaten in Lent or on the fast days of the Roman Church, is of double signification, meaning in the south of France a Coot and in the north a Scoter. By the wild-fowlers of parts of North America Scoters are commonly called Coots.

distinct genus, *Œdemia* (often misspelt *Oidemia*)—a name coined in reference to the swollen appearance of the base of the bill. The Scoter is also very generally known around the British coasts as the "Black Duck," from the male being, with the exception of a stripe of orange[1] that runs down the ridge of the bill, wholly of that colour. In the representative American form, *Œ. americana*, the protuberance at the base of the bill, black in the European bird, is orange as well. Of all Ducks the Scoter has perhaps the most marine habits, keeping the sea in all weathers, and rarely resorting to land except for the purpose of breeding. Even in summer small flocks of Scoters may generally be seen in the tideway at the mouth of any of the larger British rivers or in mid-channel, while in autumn and winter these flocks are so increased as to number thousands of individuals, and the water often looks black with them. A second species, the Velvet-Duck, *Œ. fusca*, of much larger size, distinguished by a white spot under each eye and a white bar on each wing, is far less abundant than the former, but examples of it are occasionally to be seen in company with the commoner one, and it too has its American counterpart, *Œ. velvetina*; while a third, known only to Europe as a straggler, the Surf-Duck, *Œ. perspicillata*, with a white patch on the crown and another on the nape, and a curiously-shaped and particoloured bill, is a not uncommon bird in North-American waters. All the species of *Œdemia*, like most of our other Sea-Ducks, have their true home in arctic or subarctic countries, but the Scoter itself is said to breed in Scotland (*Zool.* 1869, p. 1867; *Vert. Faun. Sutherl. &c.* pp. 194, 195). The females display little of the deep sable hue that characterizes their partners, but are attired in soot-colour, varied, especially beneath, with brownish white. The flesh of all these birds has an exceedingly strong taste, and, after much controversy, was allowed by the ecclesiastical authorities to rank as fish in the dietary (*cf.* Graindorge, *Traité de l'origine des Macreuses*, Caen: 1680; and *Correspondence of John Ray*, Ray Soc. ed. p. 148).

SCOUTI-ALLEN, variously spelt, a name in Orkney for the Arctic Gull (SKUA).[2]

SCRABER (Gael. *Sgrab*), a name given in St. Kilda to the DOVEKEY (Martin, *St. K.* p. 58); but said to be used in the other Hebrides for the Manx SHEARWATER, which is possibly the more correct application since the word seems to be the same as the Norsk *Skrape* (Icel. *Scrofa*), which in some form or other is the ordinary Scandinavian name for a Shearwater.

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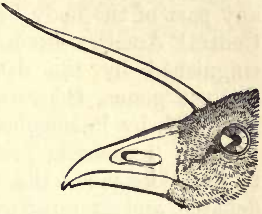
[1] This varies much in extent (J. H. Gurney, *Zool.* 1894, pp. 292-295).

[2] The allied species known to English ornithologists as Buffon's Skua is commonly called *Skaiti* by Lapps and Quæns in Finmark, and the subjacent parts of Finland and Sweden, though I have not found that word in any printed book, and know not whether it can have any connexion with the Orcadian name. We are told, and doubtless rightly, that Scandinavian words beginning with *Sk* lose the *S* when adopted by Finns; but for all that I have heard this uttered many times and seen it in manuscript still oftener.

SCRAYE, from its cry, a name for a TERN.



PALAMEDEA. (After Swainson.)

SCREAMER,[1] a bird inhabiting Guiana and the Amazon valley, so called in 1773 by Pennant (*Gen. Birds*, p. 42) "from the violent noise it makes,"—the *Palamedea*[2] *cornuta* of Linnæus. First made known in 1648 by Marcgrave under the name of "Anhima," it was more fully described and better figured by Buffon under that of *Kamichi*, still applied to it by French writers. Of about the size of a Turkey, it is remarkable for the "horn" or slender caruncle, more than three inches long, it bears on its forehead, the two sharp spurs with which each wing is armed, and its elongated toes. Its plumage is plain in colour, being of an almost uniform greyish-black above, the space round the eyes and a ring round the neck being variegated with white, and a patch of pale rufous appearing above the carpal joint, while the lower parts of the body are white. Closely related to this bird, known as the "Horned Screamer," is another first described by Linnæus as a species of *Parra* (JACANA), to which group it certainly does not belong, but separated therefrom by Illiger to form the genus *Chauna*, and now known as *C. chavaria*, or in English very generally as the "Crested Screamer,"[3] though that name was first bestowed on the SERIEMA. This bird inhabits the lagoons, swamps, and open level country of Paraguay and Southern Brazil, where it is called "Chajá" or "Chaka," and is smaller than the preceding, wanting its "horn," but having its head furnished with a dependent crest of feathers. Its face and throat are white, to which succeeds a blackish ring, and the rest of the lower parts are white, more or less clouded with cinereous. According to Mr. Gibson (*Ibis*, 1880, pp. 165, 166), its nest is a light construction of dry rushes, having its foundation in the water, and contains as many as six eggs, which are white tinged with buff. The young are covered with down of a yellowish-brown colour. A most singular habit possessed by this bird is that of rising in the air and soaring in circles at an immense altitude, uttering at intervals the very loud cry of which its local name is an imitation. From a dozen to a score may be seen at once so occupying themselves. The young are often taken from the nest and reared by the people to attend upon and defend their poultry, a duty which is faithfully[1] and, owing to the spurs with which the Chaka's wings are armed, successfully discharged. Another very curious property of this bird, which was observed by Jacquin, who brought it to the notice of Linnæus,[2] is its emphysematous condition,—there being a layer of air-cells between the skin and the muscles, so that on any part of the body being pressed a crackling sound is heard. In Central America occurs another species, *C. derbiana*, chiefly distinguished by the darker colour of its plumage. For this a distinct genus, *Ischyrornis*, was proposed, but apparently without necessity, by Reichenbach (*Syst. Avium*, p. xxi.).

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[1] In some parts of England the SWIFT is called "Screamer."

[2] This name was adopted from Möhring; but why it was given is unknown.

[3] Under this name its curious habits have been well described by Mr. W. H. Hudson (*Gentleman's Magazine*, Sept. 1885, pp. 280-287; *Argent. Orn.* ii. pp. 119-122; *Nat. in La Plata*, chap. xvii.).

The taxonomic position of the *Palamedeidæ*, for all will allow to the Screamers the rank of a Family at least, has been much debated, and cannot be regarded as fixed. Their Anserine relations were pointed out by Parker (*Proc. Zool. Soc.* 1863, pp. 511-518), and Prof. Huxley (*op. cit.* 1867, pp. 436, 460) placed them among his CHENOMORPHÆ; but this view was contravened by Garrod (*op. cit.* 1876, pp. 189-200), to whom it seemed that "the Screamers must have sprung from the primary avian stock as an independent offshoot at much the same time as did most of the other important families." Accordingly in 1880 Mr. Sclater regarded them as forming a distinct "Order," *Palamedeæ*, which he, however, placed next to the true ANSERES, from the neighbourhood of which they can hardly be removed.

SCREECH or SCREECH-BIRD, the Mistletoe-THRUSH, *Turdus viscivorus* (*cf.* SHRIKE); SCREECH-OWL, properly the Barn-OWL, *Aluco flammeus*; but not unfrequently misapplied to the SWIFT.

SCRUB-BIRD, the name (for want of a better, since it is not very distinctive) conferred upon the members of an Australian genus, one of the most curious ornithological types of the many furnished by that country. The first examples were procured by the late Mr. Gilbert between Perth and Augusta in West Australia, and were described by Gould (*Proc. Zool. Soc.* 1844, pp. 1, 2) as forming a new genus and species under the name of *Atrichia clamosa*, the great peculiarity observed by that naturalist being the absence of any bristles around the gape, in which respect alone it seemed to differ from the already-known genus *Sphenura*. In March 1866 Mr. Wilcox obtained on the banks of the Richmond river on the eastern side of Australia some other examples, which proved the existence of a second species, described by Mr. Ramsay (*op. cit.* 1866, pp. 438-440) as *A. rufescens*; but still no suspicion of the great divergence of the genus from the ordinary Passerine type was raised, and it was generally regarded as belonging to the *Maluridæ* or Australian Warblers. However, the peculiar formation of the sternum in *Atrichornis*—as the genus has to be called, since *Atrichia* had long been preoccupied in zoology[1]—attracted the present writer's attention almost as soon as that of *A. clamosa* was exhibited in the museum of the College of Surgeons, and at his request Mr. Ramsay a little later sent to the museum of the University of Cambridge examples in spirit of *A. rufescens*, which shewed a similar structure. The Scrub-birds were consequently declared in 1875 (*Encyclop. Brit.* ed. 9, iii. p. 741) to form a distinct Family, *Atrichiidæ*, standing, so far as was known, alone with the LYRE-BIRDS as "abnormal *Passeres*."[2] Much the same view was also taken by Garrod, who (*Proc. Zool. Soc.* 1876, pp. 516, 518, pl. lii.

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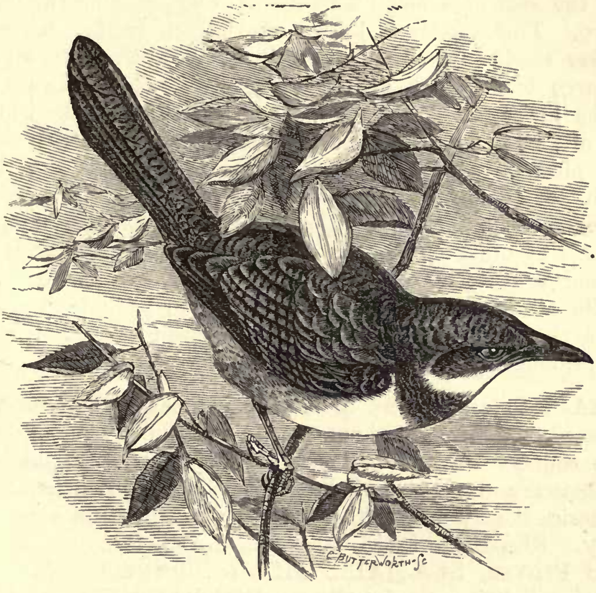
[1] Hence Latham's name for this species is "Faithful Jacana,"—he supposing it to belong to the genus in which Linnæus placed it.

[2] "Tacta manu cutis, sub pennis etiam lanosa, crepat ubique fortiter" (*Syst. Nat.* ed. 12, i. p. 260).



ATRICHORNIS CLAMOSA. (After Gould.)

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[1] This fact seems to have been detected by Dr. Stejneger (*Stand. Nat. Hist.* iv. pp. 459, 462).

[2] Mr. Sclater (*Ibis*, 1874, p. 191, note) remarked on the peculiar form of sternum; but, writing doubtless from memory, ascribed to it two emarginations on each side of the posterior end, which it has not. The sternum is fairly figured and briefly described by Eyton in 1874 (*Osteol. Av.* Suppl. ii. pl. 20,

figs. 4-7), further dwelt on the taxonomic importance of the equally remarkable characters of the syringeal muscles exhibited alike by this form and *Menura*, which he accordingly placed together in a division of the Acromyodian *Passeres*, differing from all the rest and since recognized by Mr. Sclater (*Ibis*, 1880, p. 345) as a Suborder PSEUDOSCINES—the SUBOSCINES of the present work. A detailed anatomical description of *Atrichornis* has, however, yet to be given, and a comparison of many other Australian types is needed[1] before it can be certainly said to have no nearer ally than *Menura*. Both the known species of Scrub-bird are about the size of a small Thrush—*A. clamosa* being the larger of the two. This species is brown above, each feather barred with a darker shade; the throat and belly are reddish white, and there is a large black patch on the breast; while the flanks are brown and the lower tail-coverts rufous. *A. rufescens* has the white and black of the fore-parts replaced by brown, barred much as is the upper plumage. Both species are said to inhabit the thickest "scrub" or brushwood forest; but little has been ascertained as to their mode of life except that the males are noisy, imitative of the notes of other birds and given to violent gesticulations. The nest and eggs seem never to have been found, nor indeed any example of the female of either species to have been procured, whence that sex may be inferred to escape observation by its inconspicuous appearance and retiring habits.

SEA- used as a prefix in more birds' names than can here be mentioned, and often without much precision. Thus in one part of the country SEA-CROW may be the CHOUGH, in another the CORMORANT, and very generally (especially inland) a GULL, while in America it may mean either a COOT or a SKIMMER according to locality. SEA-DOTTEREL and SEA-LARK are names of the Ringed PLOVER, SEA-MALL, -MEL (*cf.* SCAMEL) or -MEW have been used indifferently for GULLS: SEA-PARROT is the PUFFIN, SEA-PHEASANT the PINTAIL, SEA-PIE the OYSTER-CATCHER, SEA-SWALLOW a Tern, and so on.

SECONDARIES, see CUBITALS (p. 118).

SECRETARY-BIRD, a very singular African form, first accurately made known, from an example living in the menagerie of the Prince of Orange, in 1769 by Vosmaer,[2] in a treatise published

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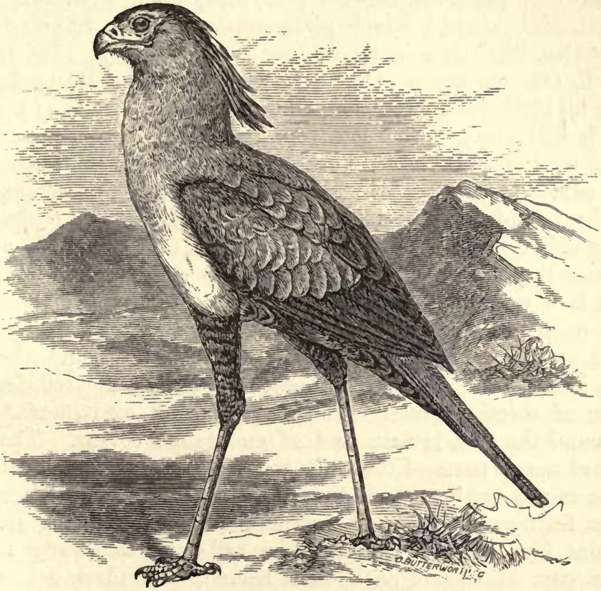
fig. 1, p. 29); but a fuller description is needed, and the figure in Garrod's paper, presently noticed in the text, is bad.

[1] Forbes shewed (*Proc. Zool. Soc.* 1882, p. 544) that ORTHONYX (p. 657) did not belong to the group as at one time had been suspected.

[2] Le Vaillant (*Sec. Voy. Afrique*, ii. p. 273) truly states that Kolben in 1719 (*Caput Bonæ Spei hodiernum*, p. 182, French version, ii. p. 198) had mentioned

simultaneously in Dutch and French, and afterwards included in his collected works issued, under the title of *Regnum Animale*, in 1804. He was told that at the Cape of Good Hope this bird was known as the "Sagittarius" or Archer, from its striding gait being thought to resemble that of a bowman advancing to shoot, but that this name had been corrupted into that of "Secretarius." In August 1770 Edwards saw an example (apparently alive, and the survivor of a pair which had been brought to England) in the possession of Mr. Raymond near Ilford in Essex; and, being unacquainted with Vosmaer's work, he figured and described it as "of a new genus" in the following year (*Phil. Trans.* lxi. pp. 55, 56, pl. ii.) In 1776 Sonnerat (*Voy. Nouv. Guinée*, p. 87, pl. 50) again



SECRETARY-BIRD.

this bird under its local name of "Snake-eater" (*Slangenvreeter*, Dutch translation, i. p. 214); but that author, who was a bad naturalist, thought it was a Pelican and also confounded it with the Spoonbill, which is figured to illustrate his account of it. Though he doubtless had seen, and perhaps tried to describe, the Secretary-bird, he certainly failed to convey any correct idea of it. Latham's suggestion (*loc. infra cit.*) that the figure of the "Grus Capensis cauda cristata" in Petiver's *Gazophylacium* (tab. xii. fig. 12) was meant for this bird is negatived by his description of it (p. 20). The figure was probably copied from one of Sherard's paintings and is more likely to have had its origin in a Crane of some species. Vosmaer's plate is lettered "Amerikaanischen Roof-Vogel," of course by mistake for "Afrikaanischen."

described and figured, but not at all correctly, the species as found also in the Philippine Islands, whither, if that be true, it must have been brought. A better representation was given by D'Aubenton (*Pl. Enl.* 721): and in 1780 Buffon (*Oiseaux*, vii. p. 330) published some additional information derived from Querhoent, saying also that it was to be seen in some English menageries; and the following year Latham (*Synops.* i. p. 20, pl. 2) described and figured it from three examples which he had seen alive in England. None of these authors, however, gave the bird a scientific name, and the first conferred upon it seems to have been that of *Falco serpentarius*, inscribed on a plate bearing date 1779, by John Frederick Miller (*Ill. Nat. Hist.* xxviii.), which plate appears also in Shaw's *Cimelia Physica* (No. 28) and is a misleading caricature. In 1786 Scopoli called it *Otis secretarius*—thus referring it to the Bustards,[1] and Cuvier in 1798 designated the genus to which it belonged, and of which it still remains the sole representative,[2] *Serpentarius*. Succeeding systematists have, however, encumbered it with many other names, among which the generic terms *Gypogeranus* and *Ophiotheres*, and the specific epithets *reptilivorus* and *cristatus*, require mention here.[3] The Secretary-bird is of remarkable appearance, standing nearly 4 feet in height, the great length of its legs giving it a resemblance to a Crane or a Heron; but the expert will at once notice that, unlike those birds, its tibiæ are feathered all the way down. From the back of the head and the nape hangs, loosely and in pairs, a series of black elongated feathers, capable of erection and dilation in periods of excitement.[4] The skin round the eyes is bare and of an orange colour. The head, neck and upper parts of the body and wing-coverts are bluish-grey, but the carpal feathers, including the primaries, are black, as also are the feathers of the vent and tibiæ,—the last being in some examples tipped with white. The tail-quills are grey for the greater part of their length, then barred with black and tipped with white; but the two middle feathers are more than twice as long as those next to them, and drooping downwards present a very unique appearance.

The habits of the Secretary-bird have been very frequently described, one of the best accounts of them being by Verreaux (*Proc. Zool. Soc.* 1856, pp. 348-352). Its chief prey consists of insects and reptiles, and as a foe to snakes it is held in high esteem. Making every allowance for exaggeration, it seems to possess a strange partiality for the destruction of the latter, and successfully attacks the most venomous species, striking them with its knobbed wings and kicking forwards at them with its feet, until they are rendered incapable of offence, when it swallows them. The nest is a huge structure, placed in a bush or tree, and in it two white eggs, spotted with rust-colour, are laid. The young remain in the nest for a long while, and even when four months old are unable to stand upright. They are very frequently brought up tame, and become agreeable not to say useful pets about a house, the chief drawbacks to them being that when hungry they will help themselves to the small poultry, and the liability of their legs to fracture, which follows on any sudden alarm, and causes death. The Secretary-bird is found, but not very abundantly and only in some localities, over the greater part of Africa, especially in the south, extending northwards on the west to the Gambia and in the interior to Khartum, where Von Heuglin observed it breeding.

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[1] Curiously enough, Boddaert in 1783 omitted to give it a scientific name.

[2] Ogilby's attempt to distinguish three species (*Proc. Zool. Soc.* 1835, pp. 104, 105) has met with no encouragement; but examples from the north of the equator are somewhat smaller than those from the south.

[3] The scientific synonymy of the species is given at great length by Drs. Finsch and Hartlaub (*Vögel. Ost-Afr.* p. 93) and later by Dr. Sharpe (*Cat. B. Brit. Mus.* i. p. 45); but each list has some errors in common.

[4] It is from the fancied resemblance of these feathers to the pens which a clerk is supposed to stick above his ear that the bird's name of Secretary is really derived.

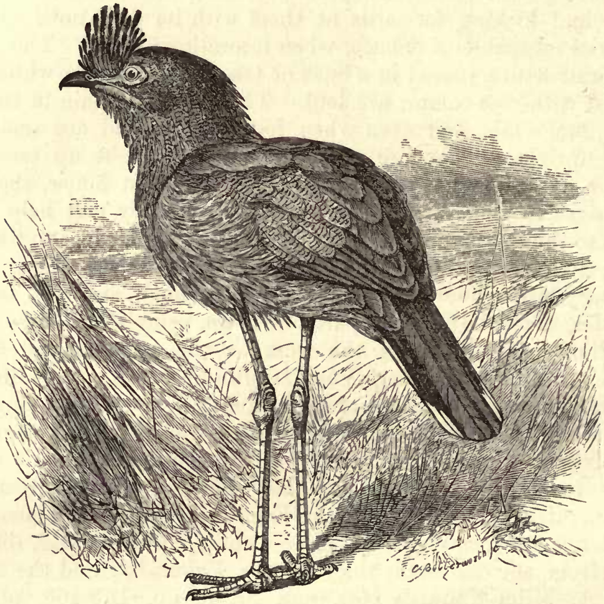
The systematic position of the genus *Serpentarius* has long been a matter of discussion, and is still one of much interest, though of late classifiers have been pretty well agreed in placing it in the Order *Accipitres.* Most of them, however, have shewn great want of perception by putting it in the Family *Falconidæ.* No anatomist can doubt its forming a peculiar Family, *Serpentariidæ,* differing more from the *Falconidæ* than do the *Vulturidæ;* and the fact of Prof. A. Milne-Edwards (*Ois. foss. Fr.* ii. pp. 465-468, pl. 186, figs. 1-6) having recognized in the Miocene of the Allier the fossil bone of a species of this genus, *S. robustus,* proves that it is an ancient form, one possibly carrying on a direct and not much modified descent from a generalized form, whence may have sprung not only the *Falconidæ* but perhaps the progenitors of the *Ardeidæ* and *Ciconiidæ,* to say nothing of others.

SEDGE-BIRD, the common name for what in most books is called the Sedge-WARBLER.

SEGGE, Angl.-Sax. *Sugge* (especially in composition as *Hegessugge*), an old name, apparently for any small bird, that seems still to survive in places for the Hedge-SPARROW; but taking also the form Heysuck (*cf.* HAY-JACK) and even corrupted into Isaac.

SENEGALI, a dealers' name which should properly belong to the *Fringilla senegala* of Linnæus, the *Estrilda* or *Lagonosticta senegala* of some modern writers, but seems to be often applied in a general way to small species of *Ploceidæ* (WEAVER-BIRD) from West Africa, or perhaps even other countries.

SERIEMA, otherwise Cariama,[1] a South-American bird, sufficiently well described and figured in Marcgrave's work (*Hist. Rer. Nat. Brasiliæ*, p. 203), posthumously published by De Laet in 1648, to be recognized by succeeding ornithologists, among whom Brisson in 1760 acknowledged it as forming a distinct genus *Cariama*, while Linnæus regarded it as a second species of *Palamedea* (Screamer, p. 819), under the name of *P. cristata*, Englished in 1785 by Latham (*Gen. Synops.* v. p. 20) the "Crested Screamer,"—an appellation, as already observed, since transferred to a wholly different bird. Nothing more seems to have been known of it in Europe till 1803, when Azara published at Madrid his observations on the birds of Paraguay (*Apuntamientos*, No. 340), wherein he gave an account of it under the name of "Saria," which it bore among the Guaranis,—that of "Cariama" being applied to it by the Portuguese settlers, and both expressive of its ordinary cry.[2] It was not, however, until 1809 that this very remarkable



Seriema.

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[1] In this word the initial C, as is usual in Portuguese, is pronounced soft, and the accent laid upon the last syllable.

[2] Yet Forbes states (*Ibis*, 1881, p. 358) that *Seriema* comes from *Siri*, "a diminutive of Indian extraction," and *Ema*, the Portuguese name for the Rhea (*cf.* Emeu, p. 212, note 1), the whole thus meaning "Little Rhea."

form came to be autoptically described scientifically. This was done by the elder Geoffroy-St. Hilaire (*Ann. du Muséum*, xiii. pp. 362-370, pl. 26), who had seen a specimen in the Lisbon museum; and, though knowing it had already been received into scientific nomenclature, he called it anew *Microdactylus marcgravii.* In 1811 Illiger, without having seen an example, renamed the genus *Dicholophus*—a term which has since been frequently applied to it—placing it in the curious congeries of forms having little affinity which he called *Alectorides.* In the course of his travels in Brazil (1815-17) Prince Max of Wied met with this bird, and in 1823 there appeared from his pen (*N. Act. Acad. L.-C. Nat. Curiosorum*, xi. pt. 2, pp. 341-350, tab. xlv.) a very good contribution to its history, embellished by a faithful life-sized figure of its head. The same year Temminck figured it in the *Planches Coloriées* (No. 237). It is not easy to say when any example of the bird first came under the eyes of British ornithologists; but in the Zoological *Proceedings* for 1836 (pp. 29-32) Martin described the visceral and osteological anatomy of one which had been received alive the preceding year.[1]

The Seriema, owing to its long legs and neck, stands some two feet or more in height, and in menageries bears itself with a stately deportment. Its bright red beak, the bare greenish blue skin surrounding its large yellow eyes, and the tufts of elongated feathers springing vertically from its lores, give it a pleasing and animated expression; but its plumage is generally of an inconspicuous ochreous-grey above and dull white beneath,—the feathers of the upper parts, which on the neck and throat are long and loose, being barred by fine zigzag markings of dark brown, while those of the lower parts are more or less striped. The wing-quills are brownish-black, banded with mottled white, and those of the tail, except the middle pair, which are wholly greyish-brown, are banded with mottled white at the base and the tip, but dark brown for the rest of their length. The legs are red. The Seriema inhabits the *campos* or elevated open parts of Brazil, from the neighbourhood of Pernambuco to the Rio de la Plata, extending inland as far as Matto Grosso (long. 60°), and occurring also, though sparsely, in Paraguay. It lives in the high grass, running away in a stooping posture to avoid discovery on being approached, and taking flight only at the utmost need. Yet it builds its nest in thick bushes or trees at about a man's height from the ground, therein laying two eggs, which Burmeister likened to those of the Land-Rail in colour.[2] The young are hatched fully covered with grey down, relieved by brown, and remain for some time in the nest. The food of the adult is almost exclusively animal,—insects, especially large ants, snails, lizards and snakes; but it also eats certain large red berries.

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[1] The skeleton has been briefly described and figured by Eyton (*Osteol. Avium*, p. 190, pls. 3, K, and 28 bis, fig. 1).

[2] This distinguished author twice cites the figure given by Thienemann (*Fortpflanzungsgesch. gesammt. Vögel*, pl. lxxii. fig. 14) as though taken from a genuine specimen; but little that can be called Ralline in character is

Until 1860 the Seriema was believed to be without any near relative in the living world of birds;[1] but in the Zoological *Proceedings* for that year (pp. 334-336) Dr. Hartlaub described an allied species discovered by Prof. Burmeister in the territory of the Argentine Republic.[2] This bird, which has since been regarded as entitled to generic division under the name of *Chunga burmeisteri* (*Proc. Zool. Soc.* 1870, p. 466, pl. xxxvi.), and seems to be known in its native country as the "Chunnia," differs from the Seriema by frequenting forest or bushy districts. It is also darker in colour, has less of the frontal crest, shorter legs, a longer tail and the markings beneath take the form of bars rather than stripes. In other respects the difference between the two birds seems to be immaterial.

There are few birds which have more exercised the taxonomer than this, and the reason seems to be plain. The Seriema must be regarded as the not greatly modified heir of some very old type, such as one may fairly imagine to have lived before many of the existing groups of birds had become differentiated. Looking at it in this light, we may be prepared to deal gently with the systematists who, having only the present before their eyes, have relegated it positively to this, that or the other Order, Family or other group of birds. There can be no doubt that some of its habits point to an alliance with the BUSTARD or perhaps certain PLOVERS, while its digestive organs are essentially, if not absolutely, those of the HERON. Its general appearance recalls that of the SECRETARY-BIRD; but this, it must be admitted, may be merely an analogy and may indicate no affinity whatever. On the one hand we have had authorities, starting from bases so opposed as Prof. W. K. Parker (*Proc. Zool. Soc.* 1863, p. 516) and Sundevall, placing it among the *Accipitres*, while on the other Nitzsch, Burmeister,[3] Martin (*ut suprà*), and Dr. Gadow (*Journ. f. Orn.* 1876,

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observable therein. The same is to be said of an egg laid in captivity at Paris; but a specimen in Mr. Walter's possession undeniably shews it (*Proc. Zool. Soc.* 1881, p. 2).

[1] A supposed fossil *Cariama* from the caves of Brazil, mentioned by Bonaparte (*Comptes Rendus*, xliii. p. 779) and others, has since been shewn by Reinhardt (*Ibis*, 1882, pp. 321-332) to rest upon the misinterpretation of certain bones, which the latter considers to have been those of a *Rhea*.

[2] Near Tucuman and Catamarca (Burmeister, *Reise durch die La Plata Staaten*, ii. p. 508).

[3] Nitzsch, as Burmeister stated in his masterly contribution to the natural history of this bird (*Abhandl. naturf. Gesellsch. Halle*, i. pp. 1-68, pls. 1, 2),

pp. 445, 446) have declared in effect that this view of its affinities cannot be taken. Prof. Huxley (*Proc. Zool. Soc.* 1867, p. 455) expressed himself more cautiously, and, while remarking that in its skull "the internasal septum is ossified to a very slight extent, and the maxillo-palatine processes may meet in the middle line, in both of which respects it approaches the birds of prey," added that "the ossified part of the nasal septum does not unite below with the maxillo-palatines," and that in this respect it is unlike the *Accipitres*; finally he declared (p. 457) that, as *Otis* connects the *Geranomorphæ* with the *Charadriomorphæ*, so *Cariama* connects the former with the *Aetomorphæ*, "but it is a question whether these two genera may be better included in" the *Geranomorphæ*, "or made types of separate groups." The latter course is followed by Prof. Fürbringer (*Untersuchungen*, p. 1566) and Dr. Gadow (*Thier-reich*, *Vögel*, ii. pp. 184-186), who unhesitatingly regard the Seriema as the type of a distinct Family, whose nearest living allies may be found in the *Gruidæ* (CRANE), *Psophiidæ* (TRUMPETER) and *Otididæ* (BUSTARD)—a determination which is probably final.

SERIN, Fr. *Serin*, O.F. *Serene*, Provenç. *Serena*, supposed to be from *Sirène* (Lat. *Siren*), and applied to the bird from its agreeable song—the *Fringilla serinus* of Linnæus and *Serinus hortulanus* of recent ornithologists—a small FINCH long known to inhabit Southern Europe with Northern Africa, and of late years observed to be extending its range on the continent and to have appeared in England (Yarrell, *Br. B.* ed. 4, ii. p. 111). Its habits have been described by Mr. Dresser (*B. Eur.* iii. pp. 551-553) from his personal observation, and by no one better. It is nearly allied to the CANARY-BIRD, though recognizable by its tints, its larger size, proportionally shorter wings and longer tail. Dr. Sharpe (*Cat. B. Br. Mus.* xii. p. 370) accounts the latter a "subspecies" of the Serin, but without giving his reason for departing from the general practice of considering them distinct species, and thus one is unable to appreciate the validity of his judgment. He however admits 18 other species of the genus.

SHAG, the English name commonly applied all over the world to members of the genus *Phalacrocorax* in general; but specialized by British ornithological writers for *P. graculus*, the smaller of the two species which inhabit the coasts of these islands (CORMORANT, p. 106). In breeding-plumage the Shag, with its plumage of uniform glossy green, its tufted crest—the feathers of which curve

in 1834 saw a defective skeleton sent to Munich by the Brazilian travellers Spix and Martius. His description of it was not, however, published until 1853. To it is appended a description by Dr. Creplin of some *Entozoa* found in the Seriema, but this unfortunately seems to give no help as to the systematic position of the bird.

forwards—the deep yellow of the bare skin about its face, and its beryl-coloured eyes, is one of the most beautiful of sea-birds.

SHEARWATER, the name of a bird first published in Willughby's *Ornithologia* (p. 252), as made known to him by Sir T. Browne, who sent a picture of it with an account that is given more fully in Ray's translation of that work (p. 334), stating that it is "a Sea-fowl, which fishermen observe to resort to their Vessels in some numbers, swimming[1] swiftly to and fro, backward, forward, and about them, and doth as it were *radere aquam*, shear the water, from whence perhaps it had its name."[2] Ray's mistaking young birds of this kind obtained in the Isle of Man for the young of the Coulterneb, now usually called PUFFIN, has already been mentioned (p. 752); and not only has his name *Puffinus anglorum* hence become attached to this species, commonly described in English books as the Manx Puffin or Manx Shearwater, but the barbarous and misapplied word *Puffinus* has come into regular use as the generic term for all birds thereto allied, forming a well-marked group of the Family *Procellariidæ* (PETREL, p. 708), distinguished chiefly by their elongated bill, and numbering some twenty species, if not more—the discrimination of which, owing partly to the general similarity of some of them, and partly to the change of plumage which others through age are believed to undergo, has taxed in no common degree the ingenuity of those ornithologists who have ventured on the difficult task of determining their characters.[3] Shearwaters are found in nearly all the seas and oceans of the world,[4] generally within no great distance from the land, though rarely resorting thereto, except in the breeding-season. But they also penetrate to waters which may be termed inland, as the Bosphorus, where they have long attracted attention by their daily passage up and down the strait, in numerous flocks, hardly ever alighting on the surface, and from this restless habit they are known to the French-speaking part of the population as *âmes damnées*, it being held by the Turks that they are animated by condemned human souls. Four species of *Puffinus* are recorded as visiting the coasts of the United Kingdom; but the Manx Shearwater aforesaid is the only one that at present is known to occur commonly or breed in the British Islands. It is a very plain-looking bird, black above and white beneath, and about the size of a Pigeon. Some other species are considerably larger, while some are smaller, and of the former several are almost whole-coloured, being of a sooty or dark cinereous hue both above and below. All over the world Shearwaters seem to have precisely the same habits, laying their single purely white egg in a hole under ground. The young are thickly clothed with long down, and are extremely fat. In this condition they are thought to be good eating, and enormous numbers have been caught for this purpose in some localities, especially of a species commonly known as the MUTTON-BIRD, *P. brevicauda*, which used to frequent the islands off the coast of Australia; but is probably meeting if it has not already met the fate of its congener *P. auduboni* in Bermuda, where the latter was known as the "Cahow" (variously spelt) and was once abundant.[1]

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[1] By mistake, no doubt, for flying or "hovering," the latter being the word used by Browne in his *Account of Birds found in Norfolk* (Mus. Brit. MS. Sloane, 1830, fol. 5. 22 and 31), written in or about 1662. Edwards (*Gleanings*, iii. p. 315) speaks of comparing his own drawing "with Brown's old draught of it, still preserved in the British Museum," and thus identifies the latter's "Shearwater" with the "Puffin of the Isle of Man."

[2] LIRA, LYRA or LYRIE (all three forms being found) appears to be the most common local name for this bird in Orkney and Shetland; but SCRABER and *Scraib* are also used in the Hebrides. These are from the Scandinavian *Skrape* or *Skrofa*, and considering Prof. Skeat's remarks (*Etym. Dict.* p. 546) as to the alliance between the words *shear* and *scrape* it may be that Browne's hesitation as to the derivation of "Shearwater" had more ground than at first appears.

[3] Mr. Salvin's catalogue of the specimens of *Procellariidæ* in the British Museum, which is understood to be in a forward condition, will doubtless throw much light on this difficult question.

[4] The chief exception would seem to be the Bay of Bengal and thence throughout the western part of the Malay Archipelago, where, though they may occur, they are certainly uncommon.

SHEATHBILL, a bird so-called in 1781 by Pennant (*Gen. B.* ed. 2, p. 43) from the horny case [2] which ensheathes the basal part of its bill. It was first made known from having been met with on New-Year Island, off the coast of Staten Land, where Cook anchored on New Year's eve 1774.[1] A few days later he discovered the islands that now bear the name of South Georgia, and there the bird was again found,—in both localities frequenting the rocky shores. On his third voyage, while seeking some land reported to have been found by Kerguelen, Cook in December 1776 reached the cluster of desolate islands now generally known by the name of the French explorer, and here, among many other kinds of birds, was a Sheathbill, which for a long while no one suspected to be otherwise than specifically identical with that of the western Antarctic Ocean; but, as will be seen, its distinctness has been subsequently admitted.

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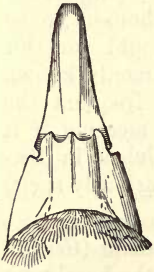
[1] Details of the mournful and instructive story of the almost complete annihilation of this species on those islands can be gathered from Lefroy's *Memorials &c. of the Bermudas or Somers Islands* (i. pp. 13, 18, 35, 36, 76, 137, 330, 331; ii. p. 578), where many extracts, chiefly from Purchas's *Pilgrimes* and Smith's *Virginia*, are given. The swine, let loose in early days by the original Spanish discoverers, produced the usual effect, but the birds still abounded on the smaller islets, where there were no hogs, and in 1614 (apparently) the settlers being reduced to distress by famine and fever, the English Governor sent 150 of the "most weake and sicke" to Couper's Isle, where were "infinite numbers of Birds called Cahowes." But through the "hunger and gluttony" of these poor people "those heavenly blessings they so much consumed and wasted by carelessness and surfeiting" that many died. The next Governor, in 1616 apparently, had to issue "a Proclamation against the spoile of Cahowes, but it came too late, for they were most destroyed before." Almost all knowledge of such a bird in the colony had vanished according to Mr. J. M. Jones (*Nat. in Bermuda*, pp. 94-96) when, in 1849, Sir John Campbell-Orde and a brother-officer visited the Black Rock, near Cooper's Island, and found three birds, the sole remnant of those that had once crowded every available part of the group. In 1874 Capt. Reid (*Zool.* 1877, p. 491) found two nests, and considered that a few pairs of the birds still frequented the islands. How many may be there now I know not.

[2] A strange fallacy arose early, and of course has been repeated late, that this case or sheath was movable. It is absolutely fixed.

The Sheathbill, so soon as it was brought to the notice of naturalists, was recognized as belonging to a genus hitherto unknown, and the elder Forster in 1788 (*Enchirid.* p. 37) conferred upon it, from its snowy plumage, the name *Chionis*, which has most properly received general acceptance, though in the same year the compiler Gmelin termed the genus *Vaginalis*, as a rendering of Pennant's English name, and the species *alba*. It has thus become the *Chionis alba* of ornithology. It is about the size of and has much the aspect of a Pigeon;[2] its plumage is pure white, its bill somewhat yellow at the base, passing into pale pink towards the tip. Round the eyes the skin is bare, and beset with cream-coloured papillæ, while the legs are bluish-grey. The second or eastern species, first discriminated by Dr. Hartlaub (*Rev. Zool.*



Bill of Chionis, from above. (After Swainson.)

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[1] Doubtless some of the earlier voyagers had encountered it, as Forster (*Descr. Anim.* p. 330) suggests and Lesson (*Man. d'Orn.* ii. p. 343) asserts; but for all practical purposes we certainly owe its discovery to the naturalists of Cook's second voyage. By some error, probably of transcription, New Zealand, instead of New-Year Island, appears in many works as the place of its discovery, while not a few writers have added thereto New Holland. Hitherto there is no real evidence of the occurrence of a Sheathbill in the waters of Australia or New Zealand; but one (*C. alba*) was shot by the lighthouse-keeper at Carlingford in Ireland, 2 Dec. 1892, as recorded by Mr. Barrington (*Zool.* 1893, p. 28; *Proc. Zool. Soc.* 1893, p. 178). Examples of this species have been often brought alive to this country, and the bird thus killed may well have escaped from confinement.

[2] In the Falkland Isles it is called the "Kelp-Pigeon," and by some of the earlier French navigators the "Pigeon blanc antarctique." The cognate species of Kerguelen Land is named by the sealers "Sore-eyed Pigeon," from its prominent fleshy orbits, as well as "Paddy-bird"—the last perhaps from its white plumage resembling that of some of the smaller Egrets, often so called.

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